

USING OUR EARTH

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USING
OUR EARTH



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by

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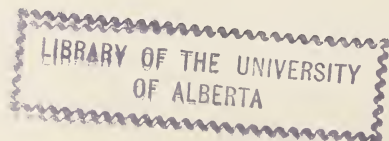
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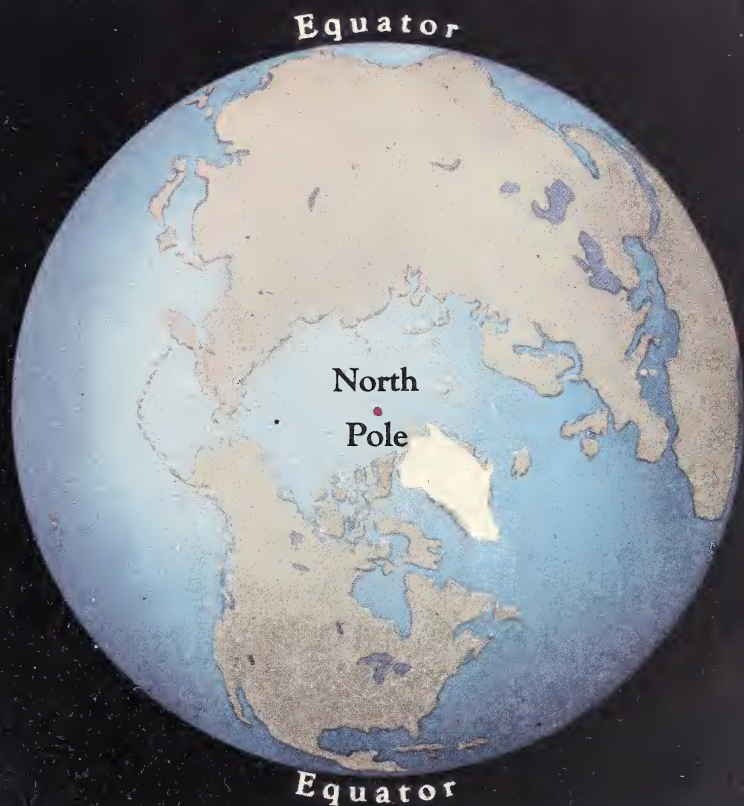
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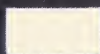
THE EARTH ON WHICH WE LIVE



Land



Water



Ice

OUR EARTH IS A SPHERE

A thousand years ago there was a full half of our world that white men had never visited. They knew nothing about the western hemisphere, the part on which we live. In those days there were many lands that people did not know about. Sailors were afraid to go far out to sea because they thought that the earth was flat. They were afraid that they might come to the edge and fall off.

Columbus, who lived more than four hundred years ago, did not believe that the earth was flat. For many hundreds of years before the time of Columbus a few people had thought that the earth is round. These men had noticed that a sailing ship went slowly out of sight as it sailed away. First, the lower part of the ship disappeared, then the sails, and last of all the tips of the masts. This could be true only if the earth is round.

Perhaps you have heard the story of how Columbus sailed westward from Spain, a country in Europe,

hoping to reach Asia. Asia, you know, is a big continent in the eastern hemisphere. Columbus and his men did not reach Asia. Instead they found a group of islands which lie between North and South America. Although Columbus had sailed for many weeks without seeing land, he had not traveled far enough to reach the lands in the eastern hemisphere. Later he made three more voyages to reach Asia by sailing westward. But he never learned that the continents of North and South America lie between western Europe and eastern Asia. Columbus did not know how very, very large our earth is.

No one could really be sure that the earth is round until Magellan proved it. A few years after Columbus discovered the new lands, Magellan began a voyage around the world. He and his men started out from Spain. They crossed the Atlantic Ocean and sailed south along the east coast of South America. When they were near the tip of that continent, they sailed westward past many islands to the Pacific Ocean. They sailed and sailed for many weeks across the Pacific Ocean. Finally about a year and a half after they left Spain,



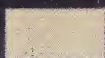
----- Magellan's Route



they reached the Philippine Islands. These islands are in the Pacific Ocean east of Asia. Magellan found friendly brown-skinned men living in the



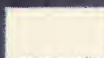
--- Magellan's Route



Continents



Oceans



Ice

Philippine Islands. He and some of his men helped an island chief who was fighting against another tribe of islanders. Magellan was killed.

His men, under another captain, sailed away from the Philippines toward the continent of Africa. They came safely around the southern tip of this large continent and sailed back to Spain. They had returned to the country from which they had started.

Magellan had reached land in the eastern hemisphere by sailing westward. His ship had gone westward and yet returned to its starting place. This could happen only if the earth is round.

Of course, Magellan could not always sail straight west. When he came to a continent, he had to travel around it. He then went in a direction between two main directions.

You know there are four main directions. They are north, south, east, and west. There are also in-between directions. These directions are northeast, northwest, southeast, and southwest. You can tell where they are by their names. Northeast is between north and east. Where is each of the other in-between directions?

When Magellan crossed the Atlantic, he sailed southwest from Europe. When he crossed the Pacific, he sailed mostly in a northwest direction.

It took his ship almost three years to go around the earth.

After Columbus discovered America, white people came here to live. Some came to the continent on which we live. They found great forests of trees wherever they went along the coast. Some were evergreen trees with straight trunks and long green needles instead of leaves. Some were trees that lose their leaves in the fall and get new leaves in the spring. Some people wanted to make their homes here. So they cleared the land and made farms.

As the people moved westward across the country, they found that it did not rain so often as in the eastern part. Trees were fewer and fewer. There was level, grassy land almost everywhere. The people who went farther west found places where it was too dry even for grass. They had to cross wide deserts and high mountains.

These people found plenty of fish in the streams. They had all the fish they needed for food. They found wild animals in the forests and on the plains. Some of the larger animals ran in great herds over the land.

Wherever white people went in this new country, they used the land to make their living. They hunted animals in the forests and on the plains and raised crops on the land to get food. Some people used the grassy lands as pastures for cattle and sheep. In this way they got meat, hides, and wool. They also built log cabins from trees which they cut down in the forest. They used the skins of animals to make clothes and shoes for their families. They also used the skins as bed covers.

Year after year more people came to our country. They used the land to get food, shelter, and clothing. Slowly changes came about in the land, and after many years much of our country no longer looked as it had in the time of the Indians.

This book tells about the earth on which we live as well as the changes that people have made in our part of the earth. Some of these changes have been good, and some have been harmful. You must learn about these changes so that you can help to keep our country a good land with fish in the streams, plenty of trees, good pastures, and rich farming lands. Then we shall always be able to get our food, clothing, and shelter from its soil.

SALMON FISHING
IN EARLY TIMES AND TODAY



HOW THE INDIANS FISHED

A long time ago before white men came to our country, many Indians lived in different parts of the land. They were strong Indians, and the men liked to fish and to hunt wild animals for food. They fished in a great river that flowed toward the setting sun between high mountains. At times big fish, called salmon, came into this river from the ocean. Salmon were easy to catch, and the Indians liked to eat them.

The Indians began fishing for salmon in the spring of the year. They went back to the same place where they had fished the year before. This place was called their fishing grounds. Sometimes they found Indians from other tribes fishing there and drove them away.

The fishermen stood on a high bank, or shore, of the river. They looked down into the water and watched the fish. The river was crowded with

salmon. There were millions of them. My, how fat they looked! Some were as long as a man's arm. They were the color of silver and bright and shiny. They had many black spots on their backs.

It was easy for the Indians to see the salmon in the clear water of the river. As the Indians watched, they saw that animals were also watching the fish. A big bear had come out of the forest and walked down to the water's edge. He went down the bank and walked out into the river on his hind legs. Then he looked down into the water and waited. Soon he dipped his head quickly into the water and caught a fine fish in his mouth. He came back to the bank. Then he walked into the forest to eat the salmon. The salmon made a good dinner, and the bear would not get hungry again for several hours.

The Indians knew that the salmon had come from the ocean. The fish were swimming up the river to the place where they had been hatched from salmon eggs. The river seemed to be full of the shiny salmon. There were so many fish that the Indians, the bears, and the other animals could catch all they wanted.



Some of the Indians had brought long spears with them. When one of these men saw a big fish that was not swimming too fast, he stuck his spear into it. Then he gave the spear a quick jerk and lifted the heavy fish out of the water. Sometimes the salmon slipped off the spear point.

An Indian boy was trying another way of fishing. He had a net fastened to a long pole. The net was woven of grass and looked like a basket. The Indian went out to the edge of the water and stood on a flat rock. He reached his pole as far as he could up the river. As he pulled the pole toward



him, a big fish swam into the net. With his strong arms he drew the pole in and lifted the net basket out of the water. He took it to shore with the fish flopping in it. Then he emptied the fish out on the grass.

At each dip of the net the Indian boy caught another salmon. The fish were fine and fat. They were so heavy that they made the top of the net draw shut.

The Indians kept fishing until they had caught all the fish they could use. Then they picked up the fish and went to the huts where they lived.

The Indian women cut the salmon open and cleaned them. That night the Indians ate some of the fresh fish for their supper. They liked the red flesh of the fish. While the salmon was being cooked, the fat bubbled out of the red flesh.

The Indians knew that fish did not stay fit to eat very long. They wanted to have salmon to eat in the winter when it was hard to hunt and fish. The women hung some of the fish up in the air to dry. They hung some of the fish up over a smoky fire and smoked them. The salmon would then keep all winter.

The Indians did not catch many fish at a time. They took only what they needed to eat and to store for the winter.

The fish in the river did not stop to eat or to rest. They swam and jumped over water falling around rocks in the river. They wanted to reach the place where they would lay their eggs. The Indians let most of the salmon go on upstream and lay their eggs. That is why there were always plenty of baby salmon, or fry, in the times of the Indians.

HOW THE WHITE MEN FISHED

White men finally came to the river where the Indians fished for salmon. They sailed up the river on a ship named "Columbia," and so the captain called the stream the Columbia River. The white men too wanted food to eat during the winter. They were glad to find a river with so many big fish.

These men told other people how easy it was to catch salmon in this stream. They thought that there would always be plenty to eat where fishing was so good. Men brought their families to live near the Columbia River.

Many salmon are hatched far up in this river. While the little fish is very small, it hides among the little stones in the shallow water. As it grows larger, it swims near the top of the water to find food. It snaps at insects which light on the water.

By the time the little salmon has grown to be

several inches long, it is ready to swim down the river into the ocean. The ocean is salty and so large that there is a great deal more water than land. If you go far out on the ocean, you see no land at all. All the young salmon stay near the shore for a while. Then most of them go far out into the ocean, no one knows where.

For a few years the salmon stays in the ocean and grows to be a big fish. Then it swims back to the place where it was hatched. It swims along with many other fish into the fresh water. A large number of fish swimming together is called a school of fish.

The school of salmon may have to swim many miles up the river to reach the place where they were hatched. There the fish will lay their eggs. Then they will die. These fish go back into the fresh water only once.

The white men soon learned that the best time to catch salmon is when the schools of fish are coming in from the ocean. Then they are fat and heavy. They do not eat on their trip up the river, but they have eaten enough in the ocean to keep them strong while they swim upstream.

White men did not fish the way the Indians fished. They used long, wide nets with holes a little larger than a salmon's head. See the net in this picture. The fisherman set it up in the river in the evening. When it was dark, the salmon could not see the net and swam into it. The salmon caught their heads in the net and could not get loose.

In the early spring the fisherman sets up a trap in the river. You can see the trap in this picture. The fisherman went out in a boat to get the fish which were caught in the trap.



As he took each fish out of the trap, he killed it by a blow on the head. Then he threw it into the bottom of his boat.

At first the white men caught only enough fish for their food that day. When they brought their families to live near the Columbia River, they needed more fish to eat and to keep for winter. Later some white men began to catch the salmon to sell.

One man began to salt the salmon and put them in barrels. The salted fish would keep longer than the fresh. The fish could then be sold in the winter.

Another man thought of a new way of keeping salmon. He cut down trees and built a big building near the river. He bought salmon from fishermen who brought their boatloads of fish to this building. Then he hired other men to help him, and they began to cut salmon up into pieces and put the salmon into tin cans. Then the lids were put on, and the cans were cooked in boiling water. The building in which the men did this work was called a cannery. Many other men began to build canneries and to can the fish. Later they used

steam to cook the salmon in cans. They could send the canned salmon to people who lived far away from the ocean.

The canneries were usually built near the places where the rivers run into the ocean. Sometimes the men built wharves out over the shallow water. They used the wharves as landing places to unload the fish. The wharves were built of wood from trees which the men cut down.

Each cannery had its own wharf. Then the fish could be brought to the cannery while they were still fresh. The water near the cannery had



to be deep enough at all times for the fishermen to tie up their boats and keep them afloat. In the picture you can see men unloading their fish at a wharf.

Fishermen have learned several ways of catching salmon. When the fish are coming into the river, men put a net into their boat and go out on the water. The net is large, and it takes several men and horses to handle it. One end of the net is made fast to the bank of the river. The bank is washed by the waves, but now the water is getting lower and lower. The waves do not come up as far on the bank as before, and we say that the tide is going out. Soon the water will be low enough for the men to wade into it.

The men row their boat out on the stream in a half circle. They are rowing upstream against the water that is flowing down. As the men row, they throw more and more of the net out into the water.

At the top of the net there are large pieces of cork which are very light and hold the net up. At the lower edge of the net there are weights which make it fall to the bottom of the river. Then the





fish cannot get away. In the middle of the net there is a big bag. The men hope that the net will make many fish go into this bag and so get caught.

Then horses pull the ropes at the free end of the net toward the bank. The men want the net to reach the bank quickly so that none of the fish can get away. If the net is moved too slowly, some of the fish may swim around the end of the net or under it. Sometimes they jump over the top of the net and get away.

The men pull the net into the shallow water. They are surprised to see how many fine fish they have. The large silvery fish are flopping about in the net, gasping for breath. Their red gills are moving open and shut as if the fish were still in the river. But fish cannot live long out of the water, and soon they lie still. The men reach into the big net and take out the salmon and put them into boats.

Some fishermen catch fish from a motorboat. They, too, have a big net which they take out into



deep water. They wait until they see a school of fish coming up the river. They then send out a man in a little rowboat, or dory, which they have been pulling along behind them. He holds one end of the net, and the motorboat circles around the school of fish.

At the bottom of the net down in the water, there is a rope which runs through iron rings on the net. When the net has been dropped all around the school of salmon, the men draw this line tight. The fish cannot get out. Then the men haul in the salmon.

When white men learned to use big nets, they



caught many more fish than the Indians did. After white men had been fishing in the Columbia River many years, the land looked different along the river. Trees have been cut down, and houses and wharves have been built. Where forests once stood, great canneries can now be seen.

Each cannery is like a little village. There are many buildings, places for boats to come in, and houses for the families of the men who work in the cannery. There is a schoolhouse, and there are churches. There are stores where families can buy their food. Many houses have gardens where the families grow vegetables and fruit. Many men work in the cannery while others build boats or houses or wharves. Others go out in fishing boats to catch salmon. Some work at packing the canned salmon in boxes to be sent to all parts of the world.

On the next page you will see the boats landing with fresh fish for the canneries. Trucks are moving along the wharf to carry things to and from the boats. Indians still like to fish along the river, but they also like to eat salmon that has been canned.



WHAT HAPPENED TO THE SALMON

Many years ago people thought there would always be plenty of salmon in rivers like the Columbia River. They did not think that the time might come when there would not be plenty of fish.

When men built big canneries, they began to plan ways of catching more fish. They wanted to can as many fish as they could catch. They caught so many that fewer fish were left to go upstream and lay their eggs. Each year fewer young salmon were hatched.

In early times when not enough big salmon came in from the ocean, the men caught some of the smaller fish and canned them. The following year there were fewer big salmon in the river. The men should not have caught the little fish. If the little fish grow to be big fish, they are much better to can.

Years ago the canneries and other factories threw dirty water and other things into the river. Canneries then did not use all parts of the fish. They threw the heads, tails, and insides into the water. When the salmon came in from the ocean and tried to swim upstream to lay their eggs, many of them died. Salmon need clear, pure water and cannot live in dirty water.

Sometimes men dug ditches from the river and let the water run into the ditches to their fields. A salmon coming up the river might swim into a ditch and lay its eggs there. When the water was shut off, the ditch dried up. There was no water for the little fish to live in. Many salmon were lost in this way before people learned to place screens over the gates to the ditches.

Of course, other fish eat salmon eggs and the salmon fry. Trout like to eat the fry. Sea lions, bears, and some birds will catch salmon. But more salmon were lost because people did not know how salmon live than because animals ate them.

One year the men at the cannery saw that fewer salmon were coming up the river than before.

They were surprised. But the next year there were still fewer salmon in the river. The men became alarmed. They were afraid that they might not have all the salmon that they needed for their canneries.

If salmon are once driven away from a river, they seldom come back. The men at the canneries knew this. They also knew that other rivers where salmon were once hatched no longer had any salmon. The men began to think that they must be more careful or salmon would never come back to the Columbia River.



SAVING THE SALMON

When people found out that fewer salmon were coming back to the river, they began to think of ways to save them. They knew that they must protect the fish. They must make it easy for salmon to go upstream to the places where they had been hatched.

In some places big walls, or dams, have been built across the river to hold the water back. It was not easy for the fish to get over these high walls. So fish ladders were built at one side of each dam. These ladders were like stairways and let the water flow gently over the wide steps. The fish could then swim or jump up the steps of the ladder and go on upstream.

You have already read that ditches had been dug so that men could take water from the river to their fields. Now the men placed screens over the gates to the ditches. You can see the screens in



this picture. The screens kept the fish out of the ditches where they would be sure to die.

Laws have been made that salmon can be taken only at certain times of the year. At other times people must not fish in the Columbia River. When people fished all the year round, they took too many fish out of the river. Then the salmon had little chance to live and grow. They were caught before they had time to grow big. Only the salmon that did not get caught were left to grow. Fewer salmon returned to lay their eggs in the river. So the laws were made to take care of the salmon.

Places have been built to raise little salmon. These places are called hatcheries. The men in a hatchery have millions of salmon eggs to take care of. When the young fish are hatched, the men put them in ponds and feed them.

When the fish grow to be several inches long, they are big enough to swim fast. Then they can escape from their enemies. At last the fish are set free in the river. They grow fast and soon find their way out to the ocean.

Millions of small salmon are placed in the streams each year. Many of these salmon will live to

come back into the river full-grown when it is time for them to lay their eggs.

The people who work for the canneries have learned to use only the fish which they need and not to spoil the waters for the salmon. They have learned not to catch so many fish that only a few will be left. They have learned not to catch the small fish.

Even though people are being more careful now, there are not as many salmon in the river and ocean as there were in the days before the white men came to the Columbia River.



USING SALMON FOR FOOD

Perhaps you have eaten fresh salmon. Maybe it was packed in ice and shipped to your butcher. This is the way many butchers sell salmon. Your salmon may have come from the Columbia River. If you live near the Columbia River, you can eat salmon soon after it is caught.

The salmon is packed in big boxes. Ice is put into the boxes to keep the fish fresh. The boxes are put on railroad cars and sent to many places. The salmon must be kept cold all the way. When your butcher gets the salmon, he will cut it up and lay the big red slices on ice until he sells them.

Sometimes salmon is smoked. You can see what smoked salmon looks like if you turn another page. It can be sent to places where there is no ice. Smoking the salmon gives it a different taste. Many people like to eat smoked salmon in sandwiches.



Most of the salmon is put into cans. The bones are left in canned salmon. But because of the way the salmon is cooked in the cans, you can chew up the bones. Sometimes people live so far from markets that they must buy food which they can keep for months. If they cannot get fresh fish, they like to have canned salmon ready to eat when they want it. They can eat it just as it comes from the can, or they can serve it in many ways. Many people like salmon in salads.

Salmon is good food. It is good to eat either hot or cold. It helps to build up the body and to

make the person who eats it strong enough to do hard work.

People like a food which may be served in different ways. Salmon may be used fresh, salted, smoked, canned, or kippered. When the fish is kippered, it is split open. Then it is salted and dried, or smoked.

The canneries near the Columbia River send canned salmon to markets all over our country. The cans are put into cartons and are shipped to nearly every country in the world.



QUESTIONS AND THINGS TO DO

1. If you have ever caught fish, tell the class about it. Tell what kinds of fish you caught and how you caught them.

2. When men fish with nets, why is it easier to catch large fish than small fish?

3. Are salmon salt-water or fresh-water fish or both?

4. Tell the story of a salmon from the time it is hatched until it dies.

5. Why did the white men catch many more salmon than the Indians did?

6. How do men fish for salmon today?

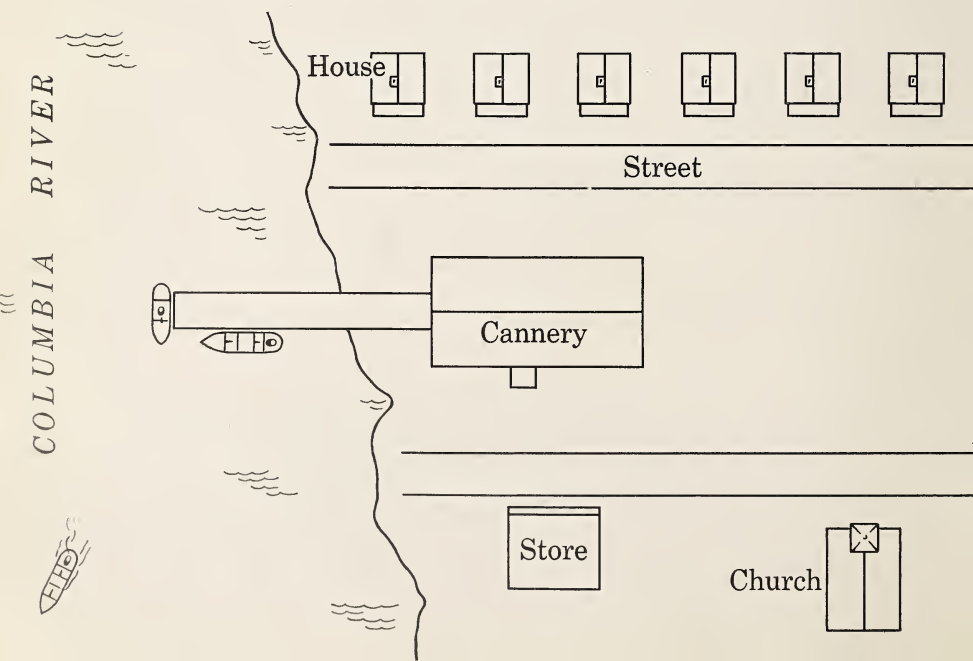
7. Our government hopes that there will always be plenty of salmon in the Columbia River. What is being done to save them?

8. Tell what is meant by "salmon fry," "a school of fish," "fish ladders," "fish hatcheries," "cleaning a fish," and "kippered salmon."

9. Draw a movie strip showing how men provide us with salmon. Each picture on your strip should show one kind of work.

10. Make a class list of ways in which salmon may be eaten.

11. Below is a plan of a cannery village. It is somewhat like a picture but easier to draw. It shows where places are, but the street and wharf and houses do not look as they would in a picture. Your teacher will copy this plan on the blackboard. Then find the wharf and write in the word wharf. Help your teacher to color the river with blue chalk. Help her to write on the plan the name of each place which is not already named.



HOW MEN HAVE CHANGED THE PASTURE LANDS



WILD ANIMALS OF THE PLAINS

Many years ago before white men came to our country, Indians lived on the western plains. These Indians lived by hunting. There were many wild animals which ate the grasses growing on the plains.

The Indians hunted the buffaloes for their meat and skins. These animals stayed together in large herds. The buffalo was a very large animal with a big head and thick, short horns. It had a large lump of flesh on its shoulders. Its body was covered with a dark brown wooly coat. The father, or male, buffalo had thick, coarse hair on his head, neck, and shoulders. The hair on his throat and chin looked like a beard.

When an Indian went out to hunt for meat, he often saw a herd of buffaloes. He watched them as they moved slowly along, grazing on the plains. Then he walked quietly toward the herd. The

Indian fitted an arrow to his bow, took aim, and shot. He knew just how to aim his arrow so that he would kill an animal.

Sometimes the Indian came on a herd of buffaloes lying down in the grass. He shouted to make them get up. Each buffalo rose on all four feet at once. The Indian shot an animal, and the herd moved on leaving the dead beast. Then the Indian skinned the buffalo and cut out the parts which he wanted for food. The skin and the meat were carried to the Indian's home. The rest of the dead animal was left for wild beasts to find and to feast on.

The Indian hunter knew that after a big rain, it would be easy to find a herd of buffaloes. There would be small ponds of water on the plains, or level lands. The buffaloes went to these low places to drink and to wallow in the mud. After a buffalo had wallowed, it was covered with a coat of mud. The mud kept flies and other insects from biting the buffalo.

The Indian also hunted other animals which grazed on the plains. He liked to hunt the elks when the herds came to the plains during the

winter. The elk is a very large animal covered with short hair. The male elk has wide branching antlers, or horns, on his head. He can fight with these antlers and kill his enemy with the short points. Elks can run fast, for they have very long legs.

During the summer the elks lived in the mountains and hilly land where there was plenty of water and food. They ate leaves and young twigs of trees and bushes. Always there was good grass for them to eat. When winter snows covered the mountains, the elks moved down to the level lands. There they ate grass and other plants. When snow covered the grass, the elk pawed it away with his front hoofs.

The Indians were glad to find herds of elks on the plains. When an Indian went out to kill an elk, he knew he must be a good hunter. If the wind blew from the hunter toward the herd, it would bring the smell of the enemy to the animals. Then they would run away. So the hunter crept up quietly against the wind and took aim with his bow. After he had killed the animal, he waited till the herd had gone beyond the dead elk. Then he

skinned it and took the best parts of the meat back to the camp. The women roasted the elk meat over a fire, and the Indians feasted.

The buffaloes and elks which the Indians hunted were fat and heavy. The animals found plenty of food on the plains. There was hardly a grass, weed, or bush which the grazing animals could not eat.

They would eat the grass in one part of the land and then move on to another part. They liked to stay near water, and they knew where they could find salt. Wild animals like salt and will go a long way to lick at rocks or earth that tastes salty. These places are called salt licks.

As the grass withered or the streams dried up, the animals moved to better grazing land. The Indians packed their belongings and moved too. They followed the animals from which they got their meat.

After a herd left a field, the grass had time to grow again. Many kinds of grass grew taller than the grass which you have seen. When an Indian wandered through a grassy valley, this tall grass might hide him from sight.

In dry places short kinds of grass grew. Where the land was dry and the grass short, there were many kinds of flowers, such as goldenrod, daisies, and sunflowers.

Year after year the grass gave food to the animals. The roots of some kinds of grass did not die. Other kinds of grass came up from the seeds grown the year before.

At that time there were no white men in our country. There were only Indians and wild animals in all the land.



COWBOYS AND THEIR HERDS

Soon after white men came to live in our country, they brought cattle to the western plains. The first cattle came from a far-off land across the wide ocean.

These cattle would look very strange to us today. They were small and thin and did not have much meat on them. They had long horns which grew out from the sides of their heads. Sometimes the horns grew so long that a man could hardly reach from the tip of one horn to the tip of the other horn.

These cattle roamed over the plains where the buffaloes grazed. Since the cattle were turned loose on the plains, they became half wild. They found their own food and water. They liked the grasses which grew on the level lands, and they learned where to find salt licks.

Some of the cattle in the herds were cows, and

some were bulls. The calves were usually born in the spring. Most cows had only one calf, but sometimes twin calves were born. Calves followed the mother cows in the herd and soon learned to eat grass. While the calf was small, the cow protected it from coyotes and wolves. With her long horns the cow could kill a wild animal. With her sharp hoofs she could trample snakes.

As more men came to live on the western plains, they brought more cattle with them. Soon there were large herds wandering over the plains as they grazed.

All this time the white men were hunting the buffaloes and other wild animals which lived on the level lands. They followed the big herds of buffaloes and often shot hundreds of animals in a day.

The white men wanted to kill the buffaloes so that their cattle could graze on the plains. Also they wanted buffalo skins to make coats and blankets to keep them warm in winter.

When the buffaloes had been killed or driven away, the white men had good pasture for their cattle. Each man had all the land he needed for

his herds. Other people heard about this good place to raise cattle and came here to live. They, too, raised cattle and sold them for meat.

The cattle moved in great herds over the plains. There were no fences at that time.

Some of the herds were so large that the owner hired cowboys to help him take care of the cattle. The cowboys wore sombreros, which were hats with wide brims. They carried ropes with a loop at one end for catching cattle.

During most of the year the cattle of different owners grazed together. In the spring the cattlemen in one part of the plains would bring all the cattle together so that each owner could separate his herd from the others. The cowboys knew they would have to ride hard for many days to round up the cattle. So a man went along in a wagon to cook food for the riders. The cowboys rolled up their blankets and tied the rolls to the backs of their saddles.

When the men had rounded up the cattle, they saw many calves in the herd. Each owner wanted to know which calves were his.

The cowboys drove the mother cows away from

the herd. The calves followed their mothers. So the owner of the mother cows knew which calves belonged to him. His cowboys kept these calves together in a little herd.

Then the owner was ready to put a mark, or brand, on each of his calves. This brand would show that the calf belonged to him. A cowboy on horseback took the rope with the loop at the end from his saddle. As he rode toward a calf, he threw the rope. He caught the calf's neck or foot in the big loop.

The horse knew what to do when the cowboy threw the rope. It stood firm on its feet to keep the calf from running. The horse backed up and stood still while the rider got off and tied up the animal.

Then the cowboy put the owner's brand on the calf. He quickly burned the mark into the animal's coat so that the hair would not grow out.

After the cowboy had branded the calf, he untied the rope and let the animal go back into the herd to graze on the good grasses.

In the herd there were many young male cattle which the owner wanted to sell. He kept the

cows because they would be the mothers of calves. He also kept a few of the males, or bulls, which would be the fathers of the calves. But other young males, called steers, would not become fathers of calves and were therefore sold for meat. In the spring roundup the cowboys separated the steers from the rest of the herd.

The cowboy rode on his horse when he worked with the cattle. Each horse was well trained and knew what its rider wanted it to do. The cowboy leaned forward in the saddle, and the horse ran toward the steer. Then the horse drove it away from the rest of the herd. The rider did not have to speak to the horse at all. The horse knew how to turn just by the way the cowboy held the reins or moved his feet.

After the steers had been separated from the herd, the owner and his cowboys drove them to market.

All year long the cattle fed on the grass, and the herds grew larger from year to year. More and more cattle were brought to the plains. The owners did not know that a time would come when many kinds of grass would be used up.

A CATTLE DRIVE

A long time ago Mr. Brown lived on the plains and owned a large herd of cattle. After the spring roundup, he was ready to drive his steers to market. He and his cowboys were going to drive the cattle toward the north.

The men started the cattle along a path, or trail, through the high grass. Once buffaloes had run over this trail. It led from stream to stream, for the buffaloes always knew where they could find water.

Mr. Brown and his men had a long way to go before they could sell the cattle. They would be on the trail for many weeks. The owner took along a cook wagon and plenty of food. The wagon also carried blankets for the men to use at night.

The cattleman also took some extra horses. The ponies on which the cowboys rode had to do so much running that they often got tired. Then the

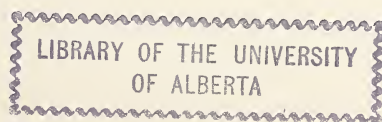
men needed to change horses. While the extra horses moved slowly, they had time to rest.

At first the steers did not want to move along. They had always grazed slowly with the big herd at the ranch. The cowboys rode along beside the steers and kept them moving ahead. Now and then an animal ran away. A cowboy made his horse run fast to bring the steer back. After a week or more the animals got used to moving along together. But the cowboys always had to watch for the steers that might try to turn back.

Every day the men and the cattle kept moving until the sun was low in the sky. Then the cowboys found a place to make camp. They needed water for the herd to drink. The animals grazed until dark. Then the steers lay down and chewed their cuds awhile before they slept.

The cook built a fire and cooked food for the men. A few of the cowboys watched the herd while the others ate. After these men had finished, the other cowboys ate.

Then most of the men rolled up in their blankets and went to sleep. The others stayed on guard. The men took turns guarding the herd at night.



Wild animals often crept near at night, and storms came up. Cattle are afraid of thunder and lightning.

One night the guards had not been watching long before lightning streaked across the sky. The guards heard the distant rumble of thunder and rode around the herd. The men who were sleeping got up and ran to their horses. The cattle sprang to their feet. But the cowboys were too fast for the steers. The men rode around the cattle and kept the herd together.

By this time big drops of rain were falling. The lightning flashed and flashed. The thunder rolled. The cowboys began to sing to the cattle, shouting their songs as loud as they could. If the cattle had become too scared, they would have run away. Then in the morning the men would have to ride many miles to bring the cattle back to the trail.

The spring shower was soon over. The cattle quieted down. Some of them began grazing, and others lay down and slept again. The guards changed places with some of the other cowboys and slept the rest of the night through.

At daylight the men had breakfast. While some of the cowboys ate, others watched the herd. The

cattle grazed on the grasses which waved in the cool breeze. Soon the sun was up in a cloudless sky. It would be warm during the day.

After all the men had eaten breakfast, Mr. Brown called out that it was time to be off. The extra horses and the cook wagon started off first. Then two cowboys led the herd of cattle.

The herd started off slowly along the trail. The cowboys did not want the cattle to run, for a running steer gets thin. Mr. Brown wanted his animals to be fat when they reached the market.

At noon the men stopped and again took turns eating. The cattle spread out along both sides of the trail and grazed. When all the cowboys had eaten dinner, they took fresh horses. Then they rounded up the cattle and started the herd again.

They had not gone far before they came to a small stream. The cattle waded in and began to drink. The stream was not deep, and the steers liked to stand and let the water flow about them. The men let the cattle drink until they had had enough. The cowboys moved the herd slowly across the stream.

A few days later the herd came to a deep stream.



The cattle and the horses had to swim across it. The cowboys rode along beside the cattle and guided them to a sandy shore where the trail began again.

After a little while a few steers began to stray away from the herd. A cowboy touched his horse with his heels and rode fast to get ahead of the animals. His horse moved faster than the steers. The cowboy circled around the cattle and drove them back to the herd.

After the chase his horse was hot and tired. The cowboy took his saddle off the pony and put it on one of the extra horses. The tired horse walked slowly along with the other loose horses.

Every day the cowboys drove the cattle farther along the trail. It was hard work, and the men were very tired. But they always looked after the steers. The cowboys saw that the animals had feed and water and did not get too tired on the trail. The men protected their cattle against dangers along the way. They stayed with the animals until they reached the market. Then the cattle drive was over. The men rode back to the ranch again to work with more cattle.

HOW THE WESTERN PLAINS WERE CHANGED

In some places the cattlemen brought so many cattle to the range that most of the grass was eaten up. If there was little rain, the grass might not grow again. When the wind blew hard, the dry soil and the roots of the grass blew away.

As you know, the roots of some kinds of grass die every year, and the new grass comes up only from seed. When there were too many cattle on the range, they ate these grasses before the seeds had grown. Then there were no seeds to come up the next year.

In parts of the range the cattle stayed on the same pasture all the year round. The grass could not grow strong and tall. Some kinds of grass began to die out.

The plants which cattle do not eat had a good chance to grow. These weeds spread over the pasture, or range. They began to take the place

of the good grass. When the weeds grew strong and tall, they kept the good grass from growing.

As more and more people came to live on the western plains, they began to make farms and to build fences. The men plowed up the grass and planted crops of wheat and corn. When there was plenty of rain, the farmers had good crops. But when there was little rain for several years, the crops would not grow. The land became dry and bare.

In some of the bare places the rain ran off in little streams and made ditches, or gullies. The water washed away the topsoil. There was, you see, no grass or trees to hold back the water. Land with deep gullies was too rough to be used for farms. Such rough land could not be used to grow feed crops or grass.

In parts of our country today cattle cannot find enough food on the range. The cattlemen must feed their cattle with grain at least part of the year. If the farmer can grow feed crops, he can still raise cattle on the range. But he must be sure that he can give them plenty of feed and water all the year round.



ON A CATTLE RANCH TODAY

Jim Connors is a cowboy on the western plains. He is proud of his saddle horse named Brownie.

Jim works on a ranch where steers are raised. The animals are sold to cattlemen who live on other ranches. Several other cowboys help Jim with the work.

See Jim's horse. Jim has owned Brownie ever since he began to work on the ranch. There are several other horses which he rides about the ranch. But Brownie is his favorite. Jim began training his horse when Brownie was about three years old. Now Brownie knows what his master wants him to do when they are working on the ranch. He knows how to run after a steer that is getting away from the herd. He also knows how to stand still when Jim is branding a calf.

The other cowboys who work on the ranch have good horses too. They feed their horses well and

train them to do different kinds of work. The horses work hard on the ranch.

Dan is a cowboy who works with Jim.





Today the cattle are being rounded up. See this cowboy driving the calves into a corral. A corral is a yard, or pen, that is fenced for animals.

There are several corrals on this ranch. Jim wants to get the calves which are to be branded into the same corral.

His horse separates, or cuts, these calves out of the herd. Then Jim drives them into the corral. The steers which are to be sold are driven into another corral.

After the animals are in the corrals, Jim throws a rope to catch a calf for branding. The rope catches the feet of the calf in the loop, and Jim pulls the loop tight. The calf is thrown to the ground and held fast. See it in the picture on the next page.

Another cowboy has heated an iron for Jim. The iron is made in the shape of the owner's brand. Jim takes the hot iron and quickly stamps it on the hip of the animal. The iron scorches the animal's skin, or hide, but does not burn it. Then Jim puts oil over the brand. If the calf gets away from the ranch, other cattlemen will know whose calf it is. Then Jim can bring the calf back to its home.

The cowboys work until all the calves in the corral have been branded.





Here are a few of the steers which are to be sold. The cattleman and a buyer look over the herd. The buyer has a ranch in the north where there is good grazing. He buys steers to fatten on his grasslands and on his corn.

The men stand and talk about what the steers are worth. The rancher wants to get the best price he can. The buyer thinks of the feed he must give the steers before they will get fat. He also thinks of the price he can get when he sells them later for meat. He thinks of many other things, too.

At last the men agree on the price, and the buyer leaves the ranch.

Later the cattleman calls Jim. . He says that he has sold the steers to a man from the north. Jim must see that the cattle are sent to the ranch where they will be fattened.

Jim does not drive the cattle north as men once did. He and some of the other cowboys drive the steers along the road to the railroad. There the steers will be put into cattle cars. The cowboys do not hurry the steers. The animals stop to graze along the way.



Since the ranches are fenced in, the cattle do not find much to eat along the road. But the cowboys bring wagonloads of hay for them. They stop at one of the ranches for water.

That evening the men and animals reach the pens near the railroad track. Jim and the cowboys give the steers plenty of hay and water. Then they put a chute up to the door of the railroad car. The chute is like a bridge with board sides. The steers are driven up the chute and into the cars.

The train comes along soon after all the steers are loaded, and Jim gets on the train too.

The other cowboys return to the ranch. There are still many steers in the pasture, and the cowboys must feed and take care of them. See the cowboy feeding the steers. He is putting cottonseed cakes on the ground. The cowboys also keep salt where the cattle can get it.

In the next picture you can see one of the steers drinking. There is no stream on this ranch, and the cowboys must keep the watering troughs filled with water. The cattle cannot go to a stream because they are fenced in. The water they drink comes from a well.



On the western plains where Jim works, there are many other ranches. The cattlemen on these ranches have learned why the grass does not grow well. They know that some kinds of grass have been used up. Now the cattlemen are trying to save the grass.

A good rancher does not put too many animals on the land. He knows just how many cattle it is best to put on each pasture.

At times the cattleman moves the steers off a pasture and lets the grass grow there. Sometimes he plants grass seeds on his land. When the grass has grown strong, he turns the cattle into the pasture to graze on it.

Some ranchers graze cattle in forests owned by our whole country. They are allowed to take a certain number of animals to a certain part of the forest. The forest ranger watches to see that the ranchers do not send too many cattle into the forest at one time. He does not want the grass to be used up.

The ranger also sees that the grass has time to grow again after a herd grazes there. Then he can rent the pasture to another cattleman.

HOW THE BUTCHER GETS BEEF

Have you ever seen a train of cattle cars in which steers are sent to market? Many of the cattle which are raised for meat are shipped from the western plains in such cars.

The steers in the next picture are standing in a fenced yard near the railroad. Soon they will be loaded into cars and shipped away.

Perhaps you can tell how the men get the steers to go into the cattle cars.

The cattle are shipped to big cities. The cars are left on railroad tracks in the stockyards, a place where there are many pens. The steers walk down a chute into a corral. Then they walk along a fenced lane into a building called a packing house. The steers are killed there, and some of their meat is quickly chilled.

Later this meat is shipped all over the country in railroad cars where it is kept very cold. The

butchers in other cities buy the beef and cut it up and sell it. The chilled meat keeps well. Have you ever seen inside a butcher's icebox? What did you see?

Some of the meat is cooked in the packing house. It is then put into cans. The cans are shipped in trucks or in railroad cars. Perhaps you have eaten canned meat. People buy it to take on vacation trips. They also eat it in parts of the country where they cannot get fresh meat. In war-time much canned meat is needed for the men of the army and navy. The Red Cross also uses it to feed starving peoples of other countries.



QUESTIONS AND THINGS TO DO

1. Which picture in this book shows a calf? Find one picture which shows full-grown cattle.

2. Bring pictures of cattle to class. Then study all the pictures that the class has found, together with the pictures of cattle in this book. Tell as much as you can about the size, shape, color, and markings of the cattle.

3. In this book you have read about two wild animals which graze. Help your teacher to find pictures of these animals. Put these pictures up on the wall and write the name of each animal under the picture. Put up a sign saying: "Wild Animals That Graze." On another wall put up pictures of "Tame Animals That Graze."

4. Why did men bring cattle to our western plains?

✓ 5. In what ways did white men make their living after many families came to our western plains?
✓ How was the land changed? Were these changes good or harmful? Why?

6. Make a list of the things which a ranchman must do to care for his cattle.

7. How does a cattleman take care of the grass growing on his pasture lands?

8. From what animal do we get beef?

9. Find out how your butcher keeps meat from spoiling.

10. What else besides meat do we get from cattle?

11. Here is a list of important words used in the stories you have read. Tell what each word means.

brand	calf	corral
roundup	plain	cattle drive
cow	gullies	ranch

12. Is the land near your school level, hilly, or mountainous?

13. Look at any streets or roads in sight. Where do they go? If there are any lakes or streams in sight, what are their names? Into what streams do they flow?

14. What do you see as you look north from the school? As you look south? Which way is east? Which way is west? How can you be sure?

15. Show the in-between directions: northeast, northwest, southeast, southwest.

HOW WE CAME
TO HAVE BLUE-GRASS FARMS



WHEN WHITE MEN CAME TO THE BLUE-GRASS COUNTRY

A long time ago a man named Joe Martin lived with his family in the eastern part of our country. They lived on the land between the ocean and the mountains. At that time few white people had ever crossed the mountains.

Joe Martin liked the country east of the mountains. But he heard from another hunter that the country on the other side of the mountains was better for hunting. The man said the woods had plenty of fine game, or wild animals which men hunt. One fall Joe crossed the mountains and went into this country. But early snows fell, and he had to leave before he saw much of the land. So he made up his mind to go back another year. He found several friends who wanted to go with him.

One bright spring morning Martin and five friends started out to cross the mountains. They knew the trip would be long and hard. Each

man rode a good horse and took along another horse on which he packed his clothing and blankets and food. The men dressed in clothing made from the skins of wild animals.

Each man wore a leather belt. On the right side of his belt he carried a hatchet which he used in chopping wood for fires. On the left side he had a hunting knife to cut up his food and to skin the animals which he killed. The men carried guns, for they knew that they would see wild animals in the mountains. Also they expected to see Indians and might have to fight them. The men carried bullets and powder to load the guns.

Martin and his friends did not take much food. They expected to hunt and fish and to live on the game which they killed.

As Martin left, his wife and children stood outside the cabin and waved until the men were out of sight. Then the family went back into the cabin. There were tears in Mrs. Martin's eyes. She knew how dangerous it was for a few men to go through the mountains. There were wild animals and Indians in the woods. The men might never come back.

The six men started off on a road where many white people had traveled. The dirt had been packed down by the feet of men and their animals. The hunters heard a mountain stream in a narrow valley, or gorge, near by. But in a short time they came to the end of the road.

Then the hunters had to follow Indian paths along the high parts, or ridges, of the mountains. Sometimes the men got off and led their horses where the trail was steep and rocky. The men watched the trail carefully, for sometimes they could hardly see which way the path went. When they came to streams, they let the horses drink. But always they kept on moving farther and farther west.

Bushes and other plants grew thick in some of the mountains. Here and there the men saw pine forests. The horses and men grew tired as they worked their way through.

The men crossed many streams and climbed up and down many hills. Then they came to a river valley at the foot of some mountains. Here a few families lived in a village.

The weary men were very glad to reach the

village. They told the people about their trip over the mountains and asked about the country ahead of them. The people told the hunters that they would find no more villages as they traveled to the west.

After Martin and the others set out again, they did not see any more white people. They traveled into an unknown land. White people had not made their homes beyond the little village where the hunters had stopped.

As the hunters journeyed on, they sometimes had to make their own trail. The forest was very still and quiet as the men traveled along. They did not talk much as they went through the woods. Indians might hear them and follow them until they made camp at night. Then the red men might try to kill the strangers.

After more than a month Martin and his men reached the country which they had set out to find. There was much rain, and there were many warm sunny days. The soil was rich, and many plants grew there. Martin and the others were glad to stop and make camp in the country which is called today the blue-grass country.

The next day Martin and one of his friends went out hunting. They walked into the forest. The trees grew close together, but between clumps of trees there were many bushes. They caught sight of a deer eating the new leaves on a bush. But as the men came nearer, the deer heard them and started to run.

At first Martin was so surprised at the sight of the deer that he stood and watched its white tail as the animal ran away. When the deer felt safe, it slowed down and trotted along, still holding its head and tail up high. Then Martin noticed that the deer took a few long low jumps through the brush, and then it leaped high into the air. In that way the deer could see whether there was any danger near it. It kept trotting along, taking several low jumps and then a high leap and more jumps.

Martin and his friends watched the deer and followed along until the animal stopped and began to feed again. Then the men crept slowly up and hid in the brush until they could get close enough to shoot. Martin took careful aim and killed the deer.

The two men tied the deer's feet together with strips of leather and slipped a pole under the leather. Then each man picked up an end of the pole and put it on his shoulder. They went back to camp.

That night the men cooked the deer meat, or venison, and had a fine supper. Later they cut some of the meat into strips and dried it in the sun. They could keep the dried meat for a long time.

The men traveled on down to the grassy plains. They saw great herds of buffaloes on the grasslands. The animals had plenty of water and good food. The older animals were followed by young calves.

The hunters knew that buffalo meat was good to eat. They were glad to find so many buffaloes. They killed as many animals as they needed. They smoked and dried the meat. They scraped and salted the skins of the animals and let them dry. When they went back to their homes east of the mountains, they would make the buffalo hides into covers.

The men knew that wildcats and panthers lived in this country too. Now and then Martin caught sight of these animals. The wildcat has a longer body and longer legs than the house cat, but the



wildcat's tail is short. Wildcats and panthers usually sleep in the daytime and go out at night to kill and eat other animals. A panther steals up quietly and then leaps on the animal. It can kill horses and cattle and wild animals much larger than itself.

At night when the men sat around their campfire, they often saw the bright eyes of wildcats and panthers. But the animals would run away and not stay close to the fire. Often the men slept on the ground between two fires. One of them stayed up to keep the fire burning and to protect the horses from panthers.

One day Martin and another man went hunting again. This time they followed along the banks of the river. As the men walked along in this beautiful country, they talked about what good farming land this would make. It would be a good land to make a home in. There would always be plenty of good hunting too.

Soon they came to wooded slopes where many kinds of trees grew. Some of the trees had delicious fruit. The men picked some dark, juicy mulberries and ate them.

The men also saw sugar maples growing in the woods. They knew that a sweet sap comes from this tree. The sap makes good sugar. But it was past the time of year to take the sap from the tree.

After the men left the forest, they came to a place where canes grew in a thicket. The cane grew in tall straight stems which were marked off into parts, or joints. It had long, narrow leaves close to the stem. The canes grew so close together that the men could hardly walk through. They took their hatchets and cut their way through this thicket, or canebrake.

One day Martin and his friend came to a place where they could see that many animals had gathered. Some of them were licking the earth. The men crept up softly through the brush. They saw buffaloes, elks, bears, and deer. They wondered why all these animals were there. Then suddenly all the animals ran off and soon disappeared in the woods. They had heard the men. The men looked at the soil and found that there was salt in it. What is such a place called?

After the hunters had camped at one place for some time, they noticed that the animals would

not come near them. So the men traveled on farther into this rich new land as they hunted.

Martin saw valleys where fields of clover were in bloom. It looked like a white carpet over the ground.

But the Indians liked this rich country too. They did not want white men to hunt and fish in their land. The Indians captured Martin and one of his friends. But the men got away from the Indians. Martin made his way back over the mountains to his family.

When the hunters reached home, they had many stories to tell about the rich land they had seen. Martin said that the land was good to raise crops.

He told people that Indians lived in the forest. He also told them how hard it was to cross the mountains. There were no roads for wagons.

Some of the people who heard Martin wanted to go at once and build homes in this rich new country. Others did not want to leave their little farms and log cabins. Others were afraid of the Indians. But all of them listened to the stories that Martin told of the land which we now call the blue-grass country.

BRINGING SETTLERS OVER THE MOUNTAINS

For a few years after Martin got away from the Indians, he planned to take some settlers back to the rich country on the other side of the mountains. Early one spring a small party of men and women were ready to leave.

They made their way along the valleys. When they had to cross mountains, they climbed up the gentler slopes. Martin wanted to make a plain path that other settlers could follow. He and the other men cut away the weeds and brush. They cut a mark into tree trunks to show the road they had traveled.

Then the band of men came to a place where cane stalks grew close together. The men had to chop their way through the canebrakes to open a road. Then they had to cut away the stalks in the ground so that the horses could have a road to walk on. For hours the men worked, chopping

down the stalks, throwing them away, and clearing a way for the horses. When the little party finally got through the canebrakes, the men were quite worn out.

Soon after the men passed through the canebrakes, they came into the rich new country. They saw the level ground covered with clover in bloom. They made camp by a stream of water. How glad they were that they had reached such a beautiful land!

Martin chose an open place for the settlers to build their homes in. On one side there was a river. The ground was covered with white clover. Near by there were two springs. One had fresh water, and the other was salty. A few beautiful trees grew in this place. Behind them there were woods and mountains. Martin was glad that men had come here to make their homes and to start farms. He felt that many people should come to live and work in this rich land.

The men began to choose places in which to build log cabins and to make farms. They went to the woods and cut down trees for logs. They cleared away the brush and plowed the land.

Then they planted the seed corn which they had brought with them. They planted gardens too in the rich soil.

But the settlers knew that they must protect their cabins from the Indians. Martin planned and helped build a big wall of logs, or a stockade, around their cabins.

Martin and the men had many battles with the Indians. Sometimes when the settlers went out to hunt deer or turkeys, they had to fight with the Indians. A few men always went along to watch for Indians while the hunters looked for game.

But after several years many more white people came to live near Martin and his friends. The new settlers helped with guarding the village, and the Indians were driven away.

As more people came, more of the land was cleared. The settlers cut down trees that had taken many years to grow. Sometimes the people cut down more trees than they could use in building their homes. They kept some of the wood to burn in their fireplaces. Then they piled up the extra trees and burned them.

After the land was cleared, the settlers planted

corn and pumpkins. They planted melon seed and set out fruit trees. They also grew vegetables and tobacco.

The men cleared land to make pastures for their cattle and sheep. They built log pens in which they raised pigs.

The men kept hunting game. For a while after people built homes in the land which we call the blue-grass country, the wild animals kept coming to the salt springs. Then they began to stay away. They were frightened by the sound of the hunter's gun. The wild animals went farther and farther into the hills to live. The buffaloes often found men at the salt licks, and before long they moved farther west on to the plains.

Sometimes a careless hunter wounded an animal and did not bother to follow it until he could end its pain. Often hunters killed more animals than they needed. Some men liked to go hunting just for fun.

Soon no wild animals came near the settlement, or place where the settlers lived. When the men wanted to hunt, they must travel several days to find buffaloes or deer.

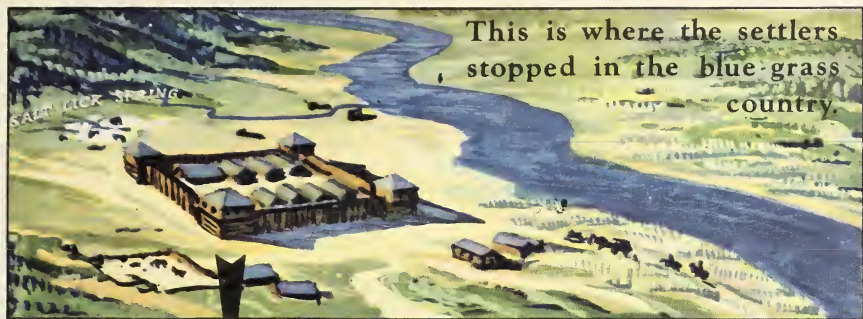
More settlers came into the valley, and some of them built larger log houses. The people kept on cutting down trees for many years, even when they had to go a long way to find large trees. They kept on hunting until some kinds of wild animals had left the country.

This picture shows the blue-grass country in the days when Joe Martin lived there. Find the place where Martin and his family lived before he crossed the mountains to go to the blue-grass country. What other places do you see in the picture?

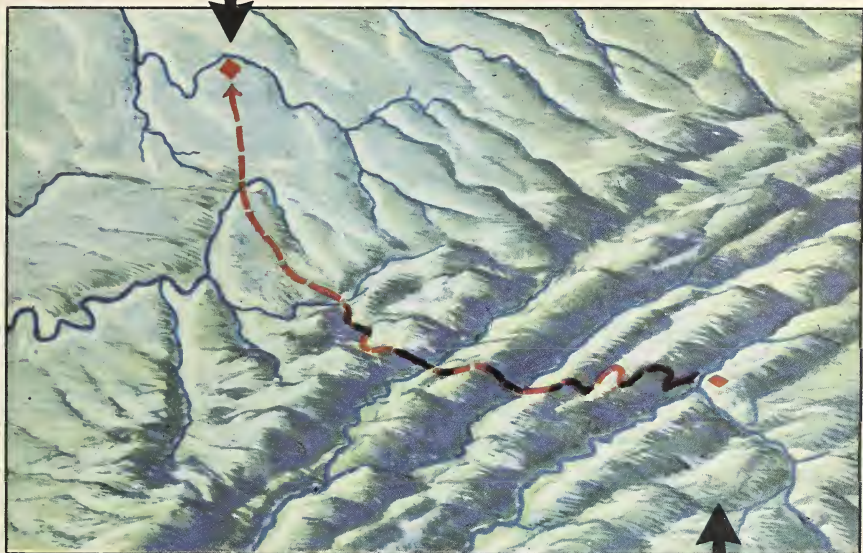
Show the route, or way, which the white men took when they crossed the mountains to reach the rich new land. What did they see as they traveled through these mountains? Tell about the canebrakes through which the white men had to chop their way. How did they feel after they had cut their way through these thickets?

Were the cabins near or far from the salt lick? Why did the animals stay away from the salt lick as the village grew larger?

Show two forests in which the settlers might hunt. What animals did the settlers find in these forests? What became of these animals?



This is where the settlers
stopped in the blue-grass
country.



This is Joe Martin's cabin
east of the mountains

ON A HORSE FARM

Jack works on a horse farm in the blue-grass country today. He takes care of race horses. See him with Wingfoot in the stable.

Wingfoot is a fine race horse. He has another long name which visitors to the farm know him by. But Jack says Wingfoot is a good name for him, because he always likes to run. Even as a colt, Wingfoot raced about the pasture. He has won many races.

When visitors come to visit the stables, Jack proudly leads them past the stall of Wingfoot. He tells them that Wingfoot always expects a carrot or an apple when anyone passes his stall. Wingfoot likes sugar too. But Jack usually has a carrot in his pocket for Wingfoot.

The dogs in the picture are coach dogs. They like to watch Jack take care of the horses, and Wingfoot likes to have the dogs stay near him.

Jack takes good care of Wingfoot and feeds him well. Jack likes horses. He likes to keep the stable clean. He gets up early so that he can exercise the horses while it is still cool. He always exercises Wingfoot first.

Wingfoot's master lives in a beautiful house on the farm. It is large, and there is a yard of blue grass all around it. Trees and flowers grow in the yard. Sometimes Jack goes up to the big house to see the master. Every day the master comes to the stable to see his horses. He often brings Wingfoot a lump of sugar.





In this picture you can see Jack and Wingfoot. Every morning Jack takes the horse out to the pasture. Wingfoot likes to run around the pasture. Jack takes out the other horses too. He wants to keep them strong and well for the time when they will run races.

In the blue-grass country today there are many horse farms. These farms have beautiful grassy pastures. Usually there is a stream of water and many trees in the pasture. Sometimes there are springs and sinkholes. A sinkhole is a low place where water sinks down into the ground. Since

it is not safe for horses to walk there, fences are built around these sinkholes.

In some of the pastures you will see frisky young colts with their mothers. These colts feed on the blue grass. It makes them grow fast. Then they are trained to be racing horses. Jack helps the men who train them.

In most of the blue-grass country there are fine houses and pastures. Some of the people still live in log cabins. Here and there you can see log cabins which the early settlers built more than a hundred years ago.





IN A TOBACCO FIELD

There are many tobacco farms in the blue-grass country. This beautiful flower grows on the tobacco plant. What color is it?

John Baker has a large field of tobacco plants which are flowering today. He goes up and down the rows of plants and picks off the blossoms. The leaves of the plant will ripen better without the flowers, and the leaf is the part which is used to make the tobacco which is smoked. John raises his tobacco to sell.

He spends a great deal of time in his tobacco fields. He watches when the leaves of the plants begin to turn yellow, for he wants to gather the plants at just the right time. If he waits until the leaves are just right, he will get better tobacco.

In about two weeks after John took off the blossoms, he sees that it is time to begin gathering. He goes into the field and splits the stalk of each



plant down almost to the ground. Then he cuts off the stalk with the leaves on it. See John working in the hot sun.



The farmer hangs the plants over sticks. He puts half of the split stalk on one side of the stick and the other half on the other side. Several

plants are put on each stick. The sticks are left in the field.

The sun is warm, and the tobacco leaves begin to wilt, or wither. John wants them to wilt for a little while.

Later in the day the men come to haul the tobacco to the barn. John has several big barns on his farm in which he puts the tobacco plants while they dry out. The tobacco stays there for a while, but there is much more work to be done with it. The farmer and his family will be very busy getting the crop ready to be sold.



THE BLUE-GRASS COUNTRY TODAY

If you went to the part of our country where Joe Martin hunted, you would not find many large forests or many wild animals. Now there are farms and towns. There are a few log cabins, but many of the houses are beautiful homes of brick, stone, or wood.

The pastures are still there. Groves of trees often grow in the pastures. Farm animals need to have shade in hot weather.

Some of the farms are large, and a few are small. The farm homes have well-kept yards with many trees. Many farmers in the blue-grass country raise horses, cattle, or sheep. The horses are kept in fine barns. These animals are the finest racing and riding horses in our country. The farmers also have big horses for hauling loads.

Sometimes you will see a great load of tobacco being hauled along the road by a team of four

horses or even six horses. The tobacco is being taken to market. It is covered with canvas so that it will not get wet.

Some of the farmers have fields in which they grow grain and feed for their farm animals. The crops grow fast because there is much rain and warm weather in the blue-grass country.

Wide roads have been built through this country. The roads wind over the hills and down into valleys. Often there are stone fences on each side of the road. These fences were built years ago when men were clearing the stones out of the fields.



QUESTIONS AND THINGS TO DO

1. How did the early settlers travel across the mountains into the blue-grass country? Why was it hard for these settlers to make this trip? How would we take such a trip today?

2. How did the early settlers in the blue-grass country get their food? What kinds of houses did they live in?

3. Read again pages 78 and 79. Draw a picture of Martin hunting deer.

4. Make a list of wild animals seen by the first settlers in the blue-grass country. What has happened to most of these animals?

5. The white settlers who came to the blue-grass country made some changes which were harmful to the land. What were these changes? Why were they harmful?

6. There are many things in the blue-grass country today which were not there in Martin's time. Name as many of these things as you can.

7. Draw a race horse and name it. Write two sentences telling how to care for a race horse.

8. Give one word for each of these: wild animals hunted for food, a narrow valley, deer meat, canes growing in a thicket, place where a few settlers live, a place where water sinks into the ground.

9. If possible, the entire class may go on a walk to see the streets or roads near the school. Then the class may make a blackboard plan of these streets or roads. If one block with four streets around it is twice as big as another, draw it so. Just outside the border of the plan write the directions, north, south, east, and west. The school may be marked on the plan with a little square. Other buildings may also be put on the plan. If one is twice as big as another, draw it so. Make a colored line to show the route that the class took on their walk. The teacher may ask you to show on the plan the easiest and shortest way to go from the school to places in the neighborhood.

MAKING A WOODLAND
INTO FARM LAND



NEW JERSEY IN THE TIME OF THE INDIANS

Over three hundred years ago a tribe of Indians called the Lenni-Lenape, or First People, lived in the eastern part of our country. These Indians were tall and straight. They burned or cut off most of their coarse, black hair. But they left a strip from the back of the neck to the middle of the forehead. Some of them left only a round patch, or lock, of hair at the top of the head. They wore a feather stuck in the long strip of hair.

The Indians were very proud of this strip or patch of hair, for it meant they had never been beaten in a battle. When an Indian won in a fight, he cut from his enemy's head the piece of skin where the long hair grew. He called the piece of skin with its lock of hair the scalp of his enemy.

These Indians wore clothes made out of animal skins. On their feet they wore moccasins of deerskin.

In cold weather they wrapped deerskin around their legs. It protected them from rain and cold. As they made their way through thickets, the thorns, branches, or twigs did not scratch their legs.

When these Indians were happy, they painted their faces with bright colors. When they were sad, they used dull colors. Their paint was made from berries, flowers, and roots which they found in the meadows.

The Lenni-Lenape Indians lived on some land which lay between two rivers and the ocean. The weather was pleasant and not too cold in this part of the country. The ocean helped to make the air cool in summer and to keep it from getting very cold in winter.

The Indians liked to live in this land, for they had no trouble getting food. They went down to the beach after the tide had gone out of the river. The sand was wet under their feet. The Indians had sharp eyes. Soon they saw the little holes in the sand which showed where clams were. The soft-shell clam lives in a smooth, thin shell. It gets its food from the water.

When an Indian began digging down into the

sand to get a soft-shell clam, it shot water up at him. But the Indian kept digging and soon he pulled the clam out of the sand. The Indian opened up the tight-closed shell. Then he used the juicy meat as food. Sometimes he boiled the clams or dried them in the sun.

The Indians also liked to eat hard-shell clams, which live in the sandy bottom of the ocean. They used the shell as jewelry. Often an Indian made the black part of the shells into beads to use as we use money. If an Indian had many fine beads, he was rich.

The Indians also liked the oysters which they got out of the ocean. An oyster is another shellfish. It lives in a thick shell and fastens itself to rocks or anything that does not move. It gets food from the very little plants and animals that live in the ocean water. The Indians pulled the oysters off the rocks and broke the shells open. They liked to eat the oysters raw. But sometimes they dried the meat of the oyster.

The Indians caught many fish in the rivers and ocean. Often they dried the fish or smoked them over a fire. The fish would then keep a long time.

The Indians could eat the dried fish in stormy or cold weather when they did not want to go fishing.

Large birds also came to the ocean to catch fish. Gulls flew out over the sand to the water. Suddenly a gull would swoop down into the water and bring up a fish. As the gulls flew about, they made hoarse cries. Gulls make a pretty picture when they spread their wings and fly along the beach or out over the water.

While the men fished and hunted, the Indian women worked in the fields. They planted and raised corn to get food for their families. They



grew beans and other vegetables too. Usually the tribe would gather the corn and other crops before they would go out to fight with other tribes who were their enemies.

The Lenni-Lenapes made boats so that they could go out on the rivers. They chopped down trees with their stone axes. Then they trimmed off the branches. They burned out the inside of the log and chopped out the burned part with sharp stones. In this way they made a space large enough to hold several persons.

When the Indians wanted to cross a river in their dugout boats, they carried the boats to the bank of the river. If the water was quiet, they could cross the stream almost anywhere.

Sometimes the water was flowing rough or fast. Then the Indians would carry their boats upstream from the place they wanted to reach. They got into the boats and moved them through the water with paddles. The boats would float down with the water, but the Indians would guide the boats with their paddles to the other side. Then they stepped out of the boats and pulled them up on the shore.

In the fall the Indians saw flocks of wild geese and ducks. These birds stopped in the marshes, or low wet lands, to feed on the seeds and plants which grew there. They ate also the insects and water bugs that lived in the water. Sometimes they stayed for a day or two before they flew on toward their winter homes in the south. When the Indians shot at the birds with their bows and arrows, the flock rose from the water and flew off to another part of the marsh. The geese made a honking cry as they flew. When the wild birds were rested, they were ready to fly away. Honking, they rose to follow their leader and make a long V in the sky as they flew south.

Sometimes the Indians saw wild turkeys in the thickets. These turkeys were much heavier than those we have at Christmastime. They were large and fat because they found so many insects, seeds, berries, and small fruits in the big thickets. It was easy for them to find plenty of food on which to grow large.

The Indians also saw birds of all colors—red, yellow, blue, scarlet, and golden. The bright wings of these birds flashed through the air when

they flew. Some of the smaller birds were thrushes and larks. They sang sweetly. Why were there so many birds in this part of the country?

The Lenni-Lenapes liked to hunt wild animals in the forests. They took their bows and arrows and started out to kill foxes and wolves for their furs. They knew where the wild animals made their homes, or dens. But the Indians had to move quietly, for the animals could hear and smell the hunters as they went through the forest. The wild animals could run very fast and get away from the hunters. If the Indians came home with a few animal skins, they had found good hunting.

The Indians also hunted bears for their furs. The bear was much larger than the fox or the wolf. When hunters killed a full-grown bear, they got a fine large skin. The bear could not run away as fast as the smaller wild animals. The Indians knew that they must kill the bear quickly. If they were slow, the wounded animal might turn on them and strike them down with his big paws before they could get away.

Indians killed the deer, too, for its skin. But



they were not afraid of the deer. It could run very fast and get away if the hunter was not a good shot. Indians liked to eat the meat of the bear and the deer.

Different kinds of squirrels lived in the trees, and there were plenty of rabbits in the forest. But an Indian had to shoot well with his bow and arrow to hit the squirrels and rabbits. They were much smaller than the foxes and wolves.

In some parts of the land where the Lenni-Lenapes lived, there were no trees. Here were grassy meadows and little brooks that ran down through

gently rolling hills. Beautiful flowers grew in the fields.

The Lenni-Lenape Indians thought this country with its trees, birds, and animals belonged to them alone.

But when white men came to this country, they liked the land too. They liked the forests and meadowland. They wanted to hunt the bears and deer for their meat and skins. They liked to hunt and eat the wild geese and wild turkeys, and they wanted to fish in this country which had belonged to the Indians until then.



WHEN WHITE MEN CAME TO NEW JERSEY

Many years ago white people came to this land where the Lenni-Lenape Indians lived. These people named the country New Jersey because one of the men had been the ruler of the Island of Jersey far away.

Ben Strong was one of the white men who brought their families to New Jersey. He came with his wife, two sons, and two daughters. First of all he had to build a house for his family to live in.

As Ben went out into the forest, he thought he had never seen so many trees. There were tall trees which would make strong hard logs. There were walnut trees which bore nuts. Chestnut trees grew there, too, and there were great forests of pine trees. Wild-grape vines and bushes grew among the trees.

Ben and his sons began clearing the space in which to build their home. They cut away the

vines and bushes. Then they chopped down some of the trees with their axes. As they worked, the ring of their axes could be heard in the forest. The men worked hard swinging their axes and got very hot. They rolled the logs to the cleared place and began to build the cabin.

Ben's neighbors helped him build his house. First they cut the logs the right length for the walls and laid them on the ground with the ends crossing each other. Where the logs crossed, the men chopped notches in the wood. Then the logs would fit close together and keep out the wind and rain. The men laid another row of logs and then another. They lifted up the heavy timbers one by one and fitted them tightly together. When the walls were high enough, they made the roof of branches and saplings, which are young trees. They covered it with layers of sod, or grassy earth. Then the family moved into the house.

At one end of the house Ben built a fireplace of stone. He hung kettles over the fire so that Mrs. Strong could cook food for the family. They had brought flour and dried foods with them. They had enough blankets to keep them warm.

Later the men cut logs into boards and built beds up against the wall.

Then Ben and his sons began to make a farm to grow food for the family. They cleared away more of the bushes and trees. After the trees fell, the sun began to shine on the ground that had long been covered by bushes and trees.

Then the farmer plowed this land. He used a homemade wooden plow. The soil was rich because leaves and twigs had rotted there for many years.

Ben planted corn and beans on one part of the land. Then he set out small apple and peach trees on another part. In a few years he would have fruit for his family.

Even though the land was good, the farmer had a hard time raising his vegetables. Insects ate up some of them. It turned very hot for a few days, and some of the plants began to wither.

In the hot summer the farmer and his family were bothered by flies and mosquitoes. When Mrs. Strong cooked supper at the fireplace, the cabin got very warm. The doors and windows of the cabin were small.

After the farmer and his sons had planted the orchard and vegetable garden, they built a barn. It was made of logs and had a long sloping roof covered with brush.

The farmer's daughters went to the woods and gathered wild berries. Also they picked the wild grapes which grew on the vines among the trees.

When winter came, there were many stormy days. Then the men cut wood into lengths for the fireplace. They also used the roots and knotty parts of the trees they had cut down. During the long winter evenings the farmer and his family worked inside the log cabin.

They gathered about the fireplace where huge logs burned. The fire warmed the cabin and gave it light. The farmer's daughters washed and dried dishes, and the farmer's wife worked at her loom by candlelight. She wove yarn into cloth. The yarn was a kind of thread which she had made from sheep's wool. On some evenings she sewed to make clothes, and the girls helped her. They had to make all the clothes which the farmer and his family wore.

The farmer and his sons were busy making shelves,

tables, and benches. There were no stores in this part of the country where they could buy furniture in those days.

One day in the spring the farmer went hunting with some of his neighbors. The men rode away on their horses over a rough trail. There were muddy places in the trail, and trees had fallen across the path. After a while the men came to a stream. Since there was no bridge, the horses had to walk across in the water. Sometimes after big rains the horses had to swim across streams.

Soon the hunters killed some wild turkeys. The farmer shot a big fat turkey for his family. It would make a fine dinner. His wife would save the turkey feathers and use the tips of the wings as a duster.

As the men went deeper into the forest, the thickets became so dense that the horses could hardly go through. The men could hear the birds twitter and chirp.

Gray squirrels ran up the tree trunks. Then a bear crossed in front of the men, and a deer bounded through the forest. The brush was so thick that an animal was soon out of sight.

That day the men took home plenty of game. Now they would have meat for their families and feathers for pillows and feather beds.

After a while the men had cleared away the tangled thickets near their homes. They had plowed and planted many fields. There were orchards and fields of grain. There were large farmhouses with flower gardens and shady yards. There were pasture lands where horses and cows grazed. There were pens for pigs and chickens, and there were big barns in which grain and hay were stored.



HOW WHITE MEN CHANGED THE LAND

After the white people had been farming in New Jersey for many years, the land did not grow as good crops as it had in the early days. At first the farmers did not know why the soil was no longer so fertile.

Can you tell what was wrong? The farmers had planted crops year after year on this land. The plants kept taking food out of the soil. There were no rotting twigs or leaves to make the soil rich again, for the fields had been cleared of trees and brush.

The farmers learned that they must fertilize the land. They began to put manure on their fields. They learned that it was best not to plant the same crop in a field year after year.

At first, as you know, the white people had cut down many trees. Some of them used the wood to build small boats or even large ships. They

wanted to go out in boats on the ocean or rivers.

In some places nothing was planted after the trees had been cut down. On sloping ground the rain water washed away some of the soil. The water made gullies here and there. Then the land would not grow good crops or make good pastures for cattle.

When the farmers planted orchards years ago, they cleaned out all the plants between the trees. No leaves or grasses were left to rot in the soil. Since many of the orchards were on sloping land, the rain made gullies in the earth.

After many years the farmers learned to plant clover or alfalfa in their orchards. When the crops were growing, they kept the rains from making gullies in the land. In the spring these crops were often plowed into the soil. The roots and dry plants decayed and fertilized the soil.

But the land in New Jersey has been farmed so much that it is not so rich as it was in the days when the Indians lived there. The forests are not so large as they once were. But men are learning how to take much better care of the land now.

ON A VEGETABLE FARM IN NEW JERSEY TODAY

The Morgan family grow vegetables on a farm in New Jersey not far from the sea. They live in a big white house with a large front porch and with oak trees growing in the front yard.

Mrs. Morgan likes her home. She is always busy taking care of the house and flower garden. She does the cooking and sewing for her large family too.

Mr. Morgan and his sons make their living by selling their vegetables to people in town. This year they are going to plant tomatoes and sweet corn in their fields.

Early in the spring while the weather is still cold, Mr. Morgan's work begins. First he prepares a hotbed for his tomato seeds. It is a long shallow box and has a glass cover that looks like a long window. In the bottom of the box he puts a layer of manure and then a layer of good soil. He plants

the tomato seeds in the hotbed and keeps the glass cover on so that the plants will not get cold.

The farmer wants to have ripe tomatoes to sell in the early summer when he can get a good price for them. Later in the summer there will be plenty of tomatoes, and the prices will be lower.

The farmer lets the little plants grow for a while. Then he sets them out in a cold frame like the one in this picture. When he planted them here, he put good soil in the cold frame. He covered it with a glass cover. The sun shone through the glass on the little plants and helped them to grow.





Sometimes the farmer took off the cover. But at night when it was cold and frosty, the cover protected the plants from cold. You can see in this picture how large the tomato plants have grown.

In the picture Mr. Morgan is the man with the big straw hat. He is reaching into the cold frame to take the plants apart. He and the other workers are getting the plants ready to be set out in the field.

After the plants have been separated, Mr. Morgan puts them in big baskets. Then he and his sons



take the baskets out into the field. These strong, healthy plants will grow well in the open air, for the cold weather is over.

There are so many plants that Mr. Morgan's sons use a machine to plant them. See Bill sitting on the back of the machine and driving it in the field. As the machine turns up the soil, Bill's brother puts a plant into the hole. Then water and fertilizer are put in, and the machine fills the hole. By using the machine the boys can set out the plants quickly.

In another field Mr. Morgan is going to plant

sweet corn. Last fall he plowed this field. He harrows the field twice to kill all of the weeds. Then later the boys plant the grains of corn. The corn will grow during the hot sunny weather.

The boys know that weeds must be kept out of their fields. One morning Tony goes up and down the rows of tomato plants with a cultivator. It loosens the soil and turns earth over the weeds. Tony will cultivate the field many times during the summer.

The corn has to be cultivated too. After it comes up, the farmer uses a machine to turn the



weeds under and keep them from growing. Weeds rob the soil of plant food.

In a few weeks the corn grows too tall for Tony to use the cultivator. Then he cuts the weeds down with a hoe, since the cornfield is small. Soon the ears of sweet corn will be ready for market.

Later in the summer there is little rain, and the fields get dry. Most vegetables need much water if they are to grow well.

Mr. Morgan waters his tomatoes by means of an overhead spray. It is like a lawn sprinkler but is made up of pipes which are several feet above the ground. There are many pipes all over the field. The water goes through tiny holes to make fine spray, or mist. The spray is so fine that it does not hurt the blossoms or small fruits on the plants. This way of watering plants is called sprinkling irrigation.

The boys know that many insects may get on their vegetables. Little worms may eat up the leaves. Worms get into corn, too.

Mr. Morgan and his sons spray their vegetables with a mixture which will kill insects. They start to spray the tomato plants soon after they



have been set out in the field. They are careful to spray the buds on the plants, for the worms like to eat the buds best. If the buds are spoiled, the farmer will not have tomatoes on his plants.

In the next picture you can see Tony and his brother spraying the plants to kill insects. The tank which holds the poison is on wheels so that it can be moved easily up and down the field. Tony turns the spray right on the plant. See where the ground is wet from the spray. The poison kills all the little bugs and worms which it reaches.



The plants grow and spread out on the ground. The buds open out into flowers, and the petals soon fall off. The bud grows into a green tomato.



As soon as some of the tomatoes are ripe, the farmer's sons gather them. See the boys at work in the field. One basket is already full. The

tomatoes are large and solid. Mr. Morgan will get a good price for them.

For a while the boys gather tomatoes once a week. When the weather gets very hot, the tomatoes ripen quickly. Then the boys gather the tomatoes every day or two. The farmer does not want any of the tomatoes to get soft before he takes them to market.

As soon as the ripe tomatoes have been gathered, the farmer and his sons pack them carefully in large crates, or boxes which are partly open on the sides. They pile the crates on a truck to be taken to market. This marketing goes on all summer, for the plants keep blooming and the tomatoes keep growing and ripening.

Near Mr. Morgan's farm are many other farms. Some of his neighbors also raise tomatoes and sweet corn. Some of them grow peas, beans, and cucumbers. Many different vegetables are raised in New Jersey. Most of the farmers have small gardens where they grow other vegetables for their families.

The man who has the farm next to Mr. Morgan's raises sweet potatoes. In this picture you can see



sacks of sweet potatoes being weighed in the field. The horse pulls the scales from place to place so that the men can weigh each sack.

Mr. Morgan and the other farmers know that they must feed their plants with fertilizer. They grow so many vegetables year after year on their farms that the plants use up the food in the soil. From year to year a farmer changes the kinds of vegetables which he grows in each field. Some vegetables take one kind of food from the ground, and others take other kinds. The farmer wants to keep the soil fertile in all of his fields.

RAISING PEACHES AND OTHER FRUIT

Janet and Tom live on a New Jersey farm where there is a peach orchard. Their father, Mr. Booker, has a thousand peach trees. He works many hours in the orchard, for the trees are old enough to bear peaches.

Tom is learning how to care for peach trees. On Saturdays when he is home from school, his father lets him help on the farm. Tom hopes to have a big peach orchard himself when he is a man. He wants to know how to look after the trees.

When Tom is working in the orchard, Janet helps her mother in the house. Janet is learning to sew. She has made herself a red print dress, and she is knitting a red sweater and cap to wear with it.

In this picture it is early spring, and the peach trees are in bloom. There are rows and rows of

trees in the orchard. Count the trees. Only a small part of the orchard is shown here.

What do you see between the trees? Why does not Mr. Booker keep the ground bare between his trees?

Janet likes to go into the orchard when the trees begin to bloom. She walks between rows of the flowering trees and looks up at the branches covered with pink blossoms. She can see the blue sky between the branches. But Janet never touches the blossoms or breaks off a branch of the flowers. Why do you think she is so careful to





leave the blossoms on the trees?

Do you see any green in this picture? Before the petals of the peach blossoms are all gone, the green



of little new leaves begins to appear.

The picture on this page shows a single branch of pink peach blossoms.

When the trees begin to blossom, insects come to lay their eggs in the buds. Soon the eggs would hatch, and the little worms would eat the fruit. But Mr. Booker sprays the trees to kill the insects. If the insects are not killed, they will ruin the peaches. Wormy fruit will not sell. The trees must be sprayed several times while the fruit is growing.

Early in August the peaches turn yellow and begin to ripen. Sometimes part of the skin of the fruit turns red. Mr. Booker watches the trees carefully, for he wants to pick the ripe fruit before the peaches get soft. He lets Tom help the men pick the firm yellow fruit.

Tom picks carefully so that he will not bruise the fruit. He gets up on a small ladder beside the tree. As he picks, he puts the peaches into a basket which hangs on a strap of leather that passes over his shoulder.

Tom fills the basket and goes down the ladder. Then he takes the peaches out of his basket and lays them in a big box. He does not pour them out, for that would bruise the peaches and make them rot.

When Tom finds peaches that are too soft to sell, he puts them in a basket and takes them to his mother. The children like to eat peaches, and they can have all they want. They break open the ripe peaches and take out the seed. The fruit is juicy and sweet. Mrs. Booker uses the ripe fruit to make pies and jam. Sometimes she crushes the fruit and makes peach ice cream.

During the winter the farmer works in his peach orchard. Then there are no leaves or blossoms on the trees. The farmer trims, or prunes, the branches. He does not want the branches to be



crowded close together. The fruit would not get enough sunshine. The sun helps to make the fruit get ripe and yellow.

If you like fruit as Tom and Janet do, you would enjoy visiting other farms in New Jersey. In the spring before fruits ripen in the orchards, strawberries are ready to be picked. There are long rows of strawberry plants growing close to the ground. Under the green leaves the farmer finds the ripe red berries. He fills small boxes with the berries and heaps them on top for good measure. Then these boxes are placed in a crate and sold to people in a neighboring city.

Blackberries and raspberries are also grown in New Jersey. Some farmers raise blueberries. They are deep blue with a silvery luster and are juicy and good to eat.

During summer and fall large clusters of juicy grapes ripen on the vines. There are many apple orchards in New Jersey too. Tom and Janet say that their mother can make the best apple pies in the world. When she bakes pies for the family, she always makes some apple turnovers for Tom and Janet.

AT THE MARKET

Once Mr. Booker let Tom go with him to take peaches to market. In the afternoon they loaded the boxes of peaches on the motor truck which was to carry them to the city.

Tom went to bed after supper and slept till his father called him about midnight. Then they got into the truck and drove away. The two big lights on the truck made the road very bright.

After a while Tom saw the lights of a big city ahead of them. They came to a wide river and crossed on a bridge. Tom saw dozens of motor trucks crossing this bridge. They were carrying fruits and vegetables to the city. That very day people would eat some of this fresh food that was coming into the city. Most people who work in the city have no way of growing their own food.

Before the sun came up, Tom and his father reached the market. It was just opening. Mr.

Booker told Tom that each farmer who came to the market had a certain place, or stall, for his truck to stand. The men did not unload their fruits and vegetables but waited for the buyers to come to the trucks.

As soon as Mr. Booker stopped the truck, he and Tom jumped down and stretched their legs. Then they saw a buyer coming to look at the peaches. He said that he needed peaches to sell in his store. Mr. Booker showed him that the peaches were firm, just as they had come from the orchard. Before he decided to buy Mr. Booker's peaches, he saw a man coming who bought for a hotel. Quickly he told Mr. Booker he would take twenty boxes.

In this market you cannot buy just a few peaches. You have to buy them by the box. You cannot buy small quantities of vegetables or fruits there. This market is called a wholesale market. Tom and his father sold their peaches wholesale. They had too many to sell a few at a time.

By daylight Mr. Booker had sold the last box of peaches. He and Tom were hungry and ate breakfast before they started home.

Here is a picture of a roadside market. Some



TWIN OAKS

MARKET

farmers sell their fruits and vegetables at such stands on the road near their home. The woman in the picture was driving along in her automobile and stopped at the market. What does the boy have to sell? The woman likes to pick out the vegetables which she buys. She has just bought some corn and is now looking at the tomatoes.

The boy keeps a few vegetables and melons on his stand. As he sells these, he puts out others. In this way his supplies are always fresh.

At this roadside market you can buy only a little at a time. This woman will buy just enough for her family to eat. If she wants to buy several boxes of peaches to can for winter, she can get them at the roadside market or from a store. A market or store which sells a little at a time is called a retail market. When you go to the store for your mother, are you buying in a wholesale or a retail market?

Many farmers in New Jersey send their crops to a factory which puts up the fruit or vegetables in cans. What vegetables have you seen in cans? Have you seen any cans that came from New Jersey?

NEW JERSEY TODAY

Today the weather in New Jersey is much the same as it was in the days of the Indians. But the land looks different and has been changed in many ways.

There are large cities in which people have to buy all the food they eat. Thousands of people live in these cities.

There are many farms for growing crops to sell to the cities. Many people have come to this part of the country to farm. Since so many men want land to use, the farm lands cost more money than they once did. The farms are smaller too.

The soil on the farms is not so rich as it once was. The farmers must feed the soil with a great deal of fertilizer. If they do not use plenty of fertilizer, they cannot grow good crops.

In this part of our country there is a long summer. Plants have plenty of time to grow before frost

comes. The breeze from the ocean helps to keep the land from getting too hot in summer or too cold in winter.

In the low marshes where wild ducks used to be hunted, cranberries have been planted. On many of the hills there are peach and apple orchards. Where oak and pine forests used to be, farmers have their homes and fields.

Today there are many good roads over which motor trucks travel. It is easy to send vegetables to the cities. Since the cities are not far away, it does not take a long time. People who work in the cities may buy the food the very day the farmer sells it.

Part of the land is still forest land. Once in a while a bear or a deer can be seen. But wild animals do not like to stay in the part of the country where people live. The animals have gone farther up into the hills or to the mountains. Men who want to hunt deer or bears have to travel farther than the Indians did in their day.

QUESTIONS AND THINGS TO DO

1. Make a list of the foods which the Lenni-Lenape Indians ate. Mark with a star each food raised by the Indians. Name the different kinds of meat they got from wild animals.

2. Draw three pictures showing how the early settlers in New Jersey built their log cabins. In the first picture show men cutting logs and laying them on the ground. In the second picture show how the logs were crossed and fitted together. What might you show in the third picture?

3. What did the New Jersey settlers use for fuel with which to cook their food and heat their homes?

4. How did they get their clothing?

5. Why is the New Jersey soil not as fertile today as it was in the time of the Indians?

6. How may soil be kept fertile?

7. Here is a list of vegetables: sweet potatoes, corn, peas, beans, cucumbers, lettuce, beets, cabbage, onions, turnips, celery. In one list put

those of which we eat the root. In another list put those of which we eat the stalk. In a third list put those of which we eat the leaves. In a fourth list put those of which we eat the seeds or the seed pods. A vegetable may be in more than one list.

8. Make a list of all the kinds of berries that you know about.

9. Make a list of all the kinds of fruits which you have seen growing.

10. Give reasons why many New Jersey farmers raise large crops on small farms. Tell how men care for the soil and water their crops in dry weather, and mention how long the summer is in New Jersey.

11. Tell two ways in which New Jersey farmers help to feed people who live in cities.

12. What is meant by these words? scalp, marsh, hotbed, cold frame, harrow, cultivator, sprinkling irrigation, wholesale, retail.

13. Find out whether the soil near your home is poor, fair, or good. If food crops are grown there, are they summer or winter crops or both?

CHANGING A DESERT
TO ORCHARD LAND





HOW WE CAME TO HAVE ORANGE TREES

Over one hundred fifty years ago white men built missions, or churches, in the southwest part of our country. Father Moreno was a priest in one of these missions.

It was very dry where Father Moreno lived. Few people made their homes in that part of the country. Outside the mission most of the land was a desert. After the winter rains it looked green. But all summer long it was brown, for there was little or no rain at that time.

The priests in the mission raised cattle and set out trees. Father Moreno had brought some orange seeds with him when he came to this land. He planted the seeds and gave them water to make them grow.

The mission was near a spring. The priests dug ditches to bring water to their trees and cattle. Indians helped them do this work. They did not

try to plant crops, for they thought the desert land was too dry.

Father Moreno's orange trees were green all the year round. They did not lose their leaves in the fall as many other trees do. The trees grew tall and beautiful and had glossy, green leaves.

The priest loved these trees and took good care of them. One spring beautiful white blossoms appeared on the orange trees. These blossoms smelled sweet.

Several weeks later when Father Moreno was watering his orange trees, he saw that small green fruit was growing where the blossoms had been. He kept watching day after day, and by fall the fruit began to ripen. Some of it had turned from green to yellow and then to orange color. There were also blossoms and green fruit on the trees.

Then Father Moreno and the other priests picked the fruit and ate it. They liked the taste, for the oranges were sweet and juicy. Other priests wanted to grow oranges on their mission lands. They too wanted to have oranges to eat. So Father Moreno gave them some seeds to plant in their mission gardens.

Other people who lived in this desert went to the missions and got seeds to plant at their homes.

At first there were only a few orange trees. When these trees began to grow well and to have fruit, the seeds were saved. Then a few men planted groves of trees. They had found that the ripe oranges would hang on the trees all winter. Some of the oranges fell to the ground. But if they were picked up soon, they were good to eat. The men gave the trees water to make them grow. People who raised oranges had plenty of the fruit to eat. But they did not have any to ship to other places.

About seventy years ago a woman named Mrs. Tibbets went to live near the mission where Father Moreno had stayed. One day a friend who lived in the eastern part of our country wrote that he was sending her two little orange trees. He told her they had come from a warm country far away. He wanted her to plant them to see whether they would grow in the place where she lived. He also told her that, when these trees were larger, they would bear fine oranges.

Her husband, Luther Tibbets, went in a wagon to meet the train which was bringing the little

trees from the east. In those days the railroad did not come all the way to the place where the Tibbets family lived.

The woman planted the two trees in her garden. During the long dry summer Mrs. Tibbets had to be careful about saving water. But she did not forget to water her orange trees. She saved the waste water from the house and poured it around the trees.

The orange trees grew bigger and bigger. Then they blossomed. The flowers were white and very sweet. Mrs. Tibbets thought that her trees, with



their white blossoms and glossy leaves, were the prettiest trees she had ever seen.

The trees kept on growing and after a few years had many oranges on them. The oranges were round and a deep golden color. They had no seeds. In the end opposite the stem end, there was a low place called a navel. It looked like a very small orange within a larger one. The oranges which grew in the mission gardens did not have navels. Mrs. Tibbets' oranges were the kind that are known today in the market as navel oranges.

The woman's neighbors wanted oranges just like hers. Most of the navel oranges were larger than those which came from the mission gardens. Since the navel oranges had no seeds, people planted little pieces cut from the branches. Many of these cuttings grew, but it took a long time for a tree to grow from a cutting. So the neighbors tried a new way. They cut little branches from the navel orange tree and slipped the thin cutting under the bark of the mission orange tree. Then they wrapped a piece of cloth around the cut. The branch soon began to get both food and moisture from the tree trunk.

It grew and produced navel oranges just like those that grew on the tree from which it had been cut.

People were glad to pay Mrs. Tibbets for cuttings from her trees. Sometimes they paid five dollars for a single cutting. In a short time many navel orange trees were growing in the neighborhood.

One of Mrs. Tibbets' trees is still living. An iron fence has been placed around it, and people go to see the tree. It is more than sixty years old, but it still blossoms and bears fruit. Today there are many navel orange trees growing in the southwestern part of our country.



THE EARLY ORANGE GROVES

When people heard about Mrs. Tibbets' trees, they wanted to grow oranges too. They came out to see her trees and bought land near by. They planted large groves of trees so that they could grow many oranges to sell.

These growers planted their groves in the valleys where the warm sun shone on the trees. They did not plant trees on the mountains and hills which were close by. Orange trees cannot live where the weather gets cold.

Sometimes many people came together and bought much desert land for an orange grove. They divided the land into small plots, or parts, and each man took a plot.

The growers had to bring water to their groves so that their trees would grow. The men dug narrow ditches in which to bring the water.

At first they brought water from streams in the mountains. But there were not many streams in this part of the country. Sometimes the men built stone or earth walls across the mountain streams. These walls kept the water from flowing away. Then the men could use the water when their groves needed it. The groves stayed green even when other land was brown and dry.

The growers also learned to bring water from springs. Where there were no springs, the men dug wells, or deep holes, to get water.

Often grass and weeds got into the ditches. Then the water did not flow on down to the groves. The grower would have to clean out his ditches.

When the oranges began to ripen on the trees, each grower picked his own fruit. He sold the oranges in the markets near by. People who did not raise oranges were very glad to buy this good, sweet fruit.

But before long many growers were raising oranges. There was more fruit than could be sold in the neighboring markets. So one man packed his oranges in boxes and sent them on a train to a distant city. He sent enough boxes to fill a whole

railroad car. It took a month for these oranges to reach the city. But most of them were still good when they got there. Since oranges were not raised near that city, the carload of fruit was sold quickly.

The growers began to sell their oranges in other cities. Sometimes a man from a city came to the groves and saw the oranges. He would offer to buy all the oranges the grower had. After such buyers had bought the crop, they picked the fruit and packed it in wooden boxes. Then they took the boxes by wagon to the railroad or to boats. They sent, or shipped, the oranges to the cities where they lived.

When the oranges left the grove, they were firm and good to eat. But many of them had decayed by the time they reached the distant places. The decayed oranges could not be sold. For a long time the growers did not know why their oranges rotted.

At last the men learned that an orange decays after it is bruised. The fruit starts to decay even from a small bruise. Oranges ought to be picked and packed carefully when they are to be sent far.

The growers began to make rules about how the oranges should be gathered and packed.

After men saw how well oranges grew in this desert land, they began to plant other kinds of fruit. They wanted to see which kinds of trees and vines would live during the summer when there was no rain.

They learned that they could grow apricots, peaches, grapes, and other fruits. One man planted the seed of some lemons which had come from a far-off country. The seed came up and grew into lemon trees.

In this picture you can see green and ripe lemons growing on the branches of a tree. How many lemons do you see which are not ripe?

Another man planted grapefruit trees. They grew as large as the orange trees. In the spring blossoms appeared on the trees, and later there was bright yellow fruit. The fruit grew in clusters somewhat like bunches of grapes. Can you tell why the fruit was called grapefruit?

But none of the fruit trees in this desert land would grow unless the growers brought water to the groves, or irrigated them.



GROWING ORANGES TODAY

Mr. Smith and his family live in their orange grove. He built their white house among the trees because the family liked to see the beautiful green trees, the sweet blossoms, and the bright color of the oranges. Can you see the oranges on the trees?

The trees are set out in straight rows. There are so many rows that it would take a long time to count them. Mr. Smith takes good care of the trees so that he will have many oranges to sell.

Every year or two he prunes his trees to remove dead branches. He does not want his trees to grow too tall, for it would then be hard to reach the oranges.

Mr. Smith knows a great deal about raising oranges. He has lived in an orange grove all his life. When he was a little boy, he helped his father take care of the trees. He liked to work in



the grove and watch the trees bloom and the fruit grow and ripen. He says that he would rather work in an orange grove than do any other kind of work in the world.

Mrs. Smith likes to live in the orange grove too. She makes jam or marmalade from the oranges and puts it up in small glass jars. Mr. Smith and the children like to eat orange marmalade on their toast at breakfast. Often they put it on hot rolls at dinner. The Smiths drink orange juice every day and eat all the oranges they want. The trees bear so many that Mr. Smith has plenty to sell.

Before the trees come into full bloom, the grower plows his orange grove. The plow loosens the soil and makes furrows between the trees. Then Mr. Smith brings water to his trees. If he does not irrigate the soil, his trees will die. His grove will become desert land.

The water is brought from a distant mountain stream through ditches. The ditches are lined with cement to keep water from going into the ground before it reaches the groves. The water comes many miles through these ditches. Then it is carried by pipes to Mr. Smith's grove.

Mr. Smith and his sons have laid water pipes across the grove. These pipes have spouts at their ends to let the water up. When the grower is ready to irrigate, he opens up these spouts. Then the water flows into the furrows and around the trees. Mr. Smith watches to see that each furrow gets enough water but not too much. The water soaks into the ground. Then the roots of the trees draw it in. Orange trees need plenty of water.

After the water has soaked in, the grower keeps the soil loose around his trees. As long as the

soil is loose, the roots of the trees can draw in the moisture which is held in the ground.

Mr. Smith and his sons like to plow and water the grove. But there is one kind of work they have other men do for them. They know that bugs and insects can get on the trees and harm the fruit. If they find insects on their trees, they send for men to come and spray the grove. The men come in a truck and spray a poison on all the trees in Mr. Smith's orange grove.

See the men at work in this picture. One man is up in the tower. When he comes to a tall tree,



he can raise his tower still higher. He is spraying the top leaves and branches. What part of the tree does the other man spray? After the men have sprayed Mr. Smith's trees, they will go to another grove.

The poison spray does not kill all kinds of insects which get on the trees. So the grower has other men come to fumigate his trees. These men bring big bags, or tents, and put one over each tree. The tent is so large that it covers the tree down to the ground. Then the men pump a poison gas inside the tent and leave the tent over the tree until all



other insects have been killed by the poison gas.

In the picture you can see one of the men who is fumigating a tree. See the machine which the man has near the tent. This machine holds the poison gas. There is a tube which carries the gas inside the tent. The thick cloth of the tent will keep the gas inside.

Even in this warm land where Mr. Smith lives, the winter nights are sometimes cold. What do you think Mr. Smith does to protect his trees against frost? In the fall he places heaters in the grove. In this picture you can see Mr. Smith and



another man bringing out a heater. It burns oil. The men will place rows of heaters in the grove. The heaters are filled with oil and are ready to light.

By looking at the thermometer, Mr. Smith tells whether the weather is cold enough to hurt his oranges. Before it gets too cold, he lights the heaters. If he did not protect his trees, part or all of his fruit might be spoiled.

See Mr. Smith putting fertilizer into the soil. The fertilizer will help his trees grow good fruit, and he will have many oranges to sell.



GATHERING ORANGES

After the new crop of oranges begins to ripen, Mrs. Smith always keeps plenty of oranges in the house. At breakfast she gives a big glass of orange juice to every member of the family. She likes to make candied orange peel by boiling the rinds of the oranges with sugar. Then she lets the rinds dry and packs them in glass jars. The little girls help her cut oranges into small pieces. Then she cooks the fruit to make orange marmalade. Sometimes she puts pieces of lemon into it.

Mr. Smith does not pick the oranges himself. The packing house where Mr. Smith will send his oranges sends several men, called a crew, to the grove. The packing house is the place where the oranges are sorted and packed for shipping. The crew of men know how to pick oranges without bruising them. What will happen if the oranges are bruised?



The pickers come and place tall stepladders beside the tree. They are careful not to break the branches or hurt the fruit. How many ladders do you see in this picture?

The pickers go up on the ladders. Each man has a pair of clippers to cut off the fruit. He wears gloves so that he will not hurt the skin of the oranges with his finger nails.

The men who are picking Mr. Smith's oranges are Jim and Henry. They make their living picking oranges. They are such good pickers that Mr. Smith is always glad to see them come.

See Jim in this picture. As he clips off the orange, he places it in the sack which he wears over his shoulder. He handles the oranges as carefully as if they were eggs.

The sun shines on Jim as he picks. He looks about him at the rows and rows of glossy green trees and the bright reddish-yellow fruit. Then he looks up at the white mountaintops. Jim thinks that it looks queer to see snow up there.

Then he calls to Henry that the crop is good this year. Henry says that the men will be busy getting all these oranges to the packing house.



When Jim's sack is full of oranges, he comes down the ladder. He goes to one of the big boxes near the tree. Then he puts his sack of oranges in the box and unbuttons the sack at the bottom. The oranges roll gently out into the box. Jim does not let the fruit fall into the box, for that would bruise it.

Jim is a fast picker. It is not long before he comes down the tree again with another sack of fruit. He moves his ladder around the tree and begins picking again. He is careful not to pick the fruit that is not ripe yet.





After many boxes have been filled with oranges, a man comes to the grove with an empty truck.

“Hello,” he calls and asks Jim to help him load the boxes. Jim empties his bag and then lifts a large box and puts it onto the floor of the truck. The driver stacks up the boxes Jim gives him. Then he drives on to the next boxes. When the truck is full, he ties a rope around the boxes to keep them from falling off the truck.

The driver takes the oranges to the packing house. Many other growers who live near by also send their oranges to this packing house.

AT THE PACKING HOUSE

When you buy an orange at the store, does it have a paper wrapper around it? Are there any words stamped on the orange? What are these words? If your oranges come from the part of the country where Mr. Smith lives, each may be wrapped in tissue paper. But Mr. Smith did not wrap up the oranges.

After his oranges have been brought into the packing house, they stand for a few days in the boxes. The skin of the oranges dries out and is not so easily bruised. All the oranges brought to the packing house are dried out in this way.

Then the oranges are washed in warm water. In this picture you can see some of the oranges being washed. The man is looking over them to see whether any of the fruit is spoiled. If he finds a soft orange, he will take it out. Only firm fruit will be shipped away.

Clear, cool water is used to rinse off the oranges, and then they are dried. The workers do not have time to pick up each orange and dry it with a cloth. So warm air is turned on the oranges to dry them. Perhaps you have dried your hands in that way.

Now the oranges are clean and shining. All the dust has been washed off. But there is still work to be done before the oranges are sent away from the packing house. What else do you think has to be done to the oranges?

Next the oranges are sorted by size. All the



largest oranges are put together. The middle-sized and small oranges go into different places. As Mr. Smith's oranges are sorted, any fruit that does not look right is taken out. Then each kind of orange is weighed and counted.

Those which came from other groves are also weighed and counted. When all the oranges are sold, each grower will get his share of the money. Mr. Smith usually gets a big share because he takes such good care of his trees.

What are the women in this picture doing? It takes fast work to wrap and pack oranges.





Sometimes a woman packs over seventy boxes a day.

Most of the boxes of oranges are sent away to places where oranges do not grow. Many boxes are sent on railroad cars. Many other boxes go across the ocean on ships to other countries. Oranges do not spoil as easily as many other fruits. So they can be shipped long distances. The finest oranges are sent to our markets at Thanksgiving and Christmas. They are sold a long way from the grove where they grew.

Some growers in the southwestern part of our

country sell oranges at roadside stands. People stop in their automobiles to buy the oranges which they need. The oranges do not cost as much as those which have to be shipped a long distance.

At some of the roadside stands there is a sign which says: Orange Juice. You can ask for a glass of orange juice. This little girl is drinking some. The woman at the stand cuts open the oranges and squeezes the juice while the little girl watches.

Sometimes you can buy orange marmalade and jars of candied orange peel too. People like to buy from the family which owns the orange trees.



HOW MEN COULD MAKE THE DESERT GROW ORANGES

In the part of the country which you have been reading about the soil is rich but dry. There are warm valleys where frost seldom comes. The mountain ranges, which are like a wall, keep off the cold winds. They protect the valleys from frost.

The ocean is also near these valleys. In winter the wind from the sea keeps the air from getting very cold, and in summer the sea breeze keeps the air from getting very hot.

The white people who made their homes in this part of the country found the land dry. Few plants were growing in this desert. It was as dry as the land which you can see in the picture on the next page.

Then these people learned that, if the land had water, it would grow different kinds of fruits. They planted oranges, lemons, grapefruit, and other fruits.



They worked to bring water to their orchards. They used the water in mountain streams and springs, and they dug wells to get more water.

In the next picture see the man planting a tree. The other man is digging a ditch to bring water to the land. See the snow on top of the mountains. The land is not barren and dry. It has been irrigated. Even hillsides have been irrigated.

The first orange groves were planted on level lands. Today many orange groves may be seen on hillsides. The growers have learned a good way to plant trees on sloping land. If trees are

planted the right way, water does not wash the loose soil down the hill.

Because the land has been irrigated, it is beautiful and fertile today. Hundreds of trees are blooming or bearing fruit below the mountains. Many people have their homes in the valleys. These people make their living from the land which they have watered.

If you should go to see these orange groves in the spring, you could drive for miles along highways with blooming trees on both sides of the road. The air would be sweet with the perfume of the



white orange blossoms. A few ripe oranges might still hang on the trees.

Many of the orange growers live in large homes built in the groves. They often have tall trees growing close together to keep off the wind. Around their houses they have planted shade trees.

But some parts of the desert do not yet have enough water near by for irrigation. Such land is still desert land today. Some of this dry land is not far from the irrigated orange groves, but it is still barren because water has not been brought to it.



QUESTIONS AND THINGS TO DO

1. In the spring look at a fruit tree from which the petals are falling to see the fruit beginning to form.

2. Find out what kinds of oranges are on sale in the markets near your home.

3. Make as long a list as you can of fruits that grow on trees.

4. Draw an orange tree with white blossoms, green fruit, and a few bright reddish-yellow fruit.

5. Here is a list of things that must be done to oranges. Copy these things and number them in the order in which they are done, 1, 2, 3, 4, 5, 6, 7.

Wrapped in paper

Washed in water

Picked from the tree

Packed in boxes

Sorted by size

Shipped in railroad cars

Taken by truck to the packing house

6. What would happen if the orange growers in dry places did not irrigate their groves?

7. If possible, visit a packing house where fruit is handled to see the different kinds of work that must be done.

8. Help your teacher make a blackboard list of the many ways in which oranges are eaten.

9. Below is a plan showing how irrigation works in many places. Where does most of the rain and snow fall? Show the mountain lake in which the water is held back. How was this lake made? Which way does the stream flow below the dam? Near the top of the dam are gates which open into long ditches. Which way do these ditches slope? Other ditches lead off from them, and still smaller ditches lead from these. When do the growers turn on the water?



MAKING ROADS
ACROSS OUR LAND



ANIMAL AND INDIAN TRAILS

If you should travel over our country today, you would find good roads and paved streets in many parts of the land. But before white men came here, there were only trails made by animals and the Indians. In many places large trees grew close together, and fallen trees lay on the ground. Bushes grew thick between the trees. Vines climbed over the bushes and trees in the forest until they made thick walls or mats. If white men had lived in our country then, it would have been hard for them to go through these forests.

But even at that time there were many trails in our forests and grasslands. Wild animals which lived in the forests made trails as they went in search of food and water. The elks, deer, and bears knew where they could find salt licks. These animals usually went one by one through the woods. Since they often followed the same path among

the trees, they beat the ground into a narrow hard trail. Grass would not grow in this hard path as long as the animals kept using it.

The buffaloes made the widest and deepest trails, because they moved in a big herd. They grazed slowly along over the good grassland. When they started for water or a salt lick, big bulls went ahead. The herd followed, and their feet pounded down the earth into a wide firm trail.

The buffaloes followed the same paths many times as they moved back and forth from their grazing lands to water. These heavy animals trampled down bushes and grass as they moved along. After thousands of buffaloes had run through the woods, the road was packed down so hard that nothing would grow there for years. These roads were often worn down so much that they were lower than the rest of the forest. With no roots of grass or other plants to hold the soil in place, wind and rain helped to wear down these roads made by the herds of buffaloes.

Wherever the herd came to hilly land, the buffaloes went over the tops of the hills. The tops of the hills were usually dry, for the water ran

off quickly. The buffaloes kept away from marshes. The ground was soft and wet there. A heavy animal would sink into it.

When the Indians needed water or salt, they often used the animal trails. The Indians made other trails too.

There was one Indian tribe that was very large. Its hunters were big and strong. They liked to hunt in a forest not far from their village. Hunters from smaller tribes liked to go to this forest too. But the strong tribe would not let other Indians hunt there.

When this strong tribe went hunting, the Indians walked along the trail, one by one, following their leader. Each carried his bow and arrow. White men had not yet brought the first horses to this country. So the Indians had no animals to ride on. They had no beasts of burden.

These Indians went to their hunting grounds many, many times, year after year. The grass was worn away on the path, and the dirt was packed down hard.

The path did not often go over rough, stony ground. These Indians knew how to make an easy

path. If they came to rough ground or to a marsh, or bog, they went around it. So most Indian trails were winding paths.

When the Indians reached their hunting grounds after a storm, they sometimes found that the forest path was filled with broken branches. The wet leaves dripped on the hunters.

The Indians often returned home over the same trail. As they reached the village, they gave loud whoops. At the sound of the whoops, the women and children in the village came out to watch for the hunters' return. Two of the Indians came carrying a deer which one of them had shot with an arrow. They had tied a piece of dried skin around its front feet and another piece around its hind feet. Then they had put a small sapling under these straps so that the deer swung from the pole by its feet. The two hunters carried the heavy deer with the ends of the pole resting on their shoulders.

Sometimes the Indians followed trails that led along a river toward their hunting or fishing grounds. The trails wound around as the river turned. At some places the Indians wanted to cross the stream.

If the river was narrow, they cut down a tree so that it fell across the stream. Then they walked across on the log. They clung to the rough bark with their bare feet or their moccasins. Could you cross on a log as the Indians did without slipping or falling?

At times they traveled on the water in canoes made of bark. They paddled so quietly that you could not hear a sound. They went as far on the river as they could. Then they looked for a good landing place. They got out of their canoes and drew them up on the bank. Then each Indian picked up his canoe, swung it up over his head, and carried it as he followed the trail on land. Since the canoes were light, an Indian could carry a canoe several miles to the next stream or lake. Then the Indians put the canoes into the water, stepped in, and paddled on their way. They made their journeys on land by trail and on the water by canoe.

The part of the trail where the Indian carried his canoe is called a portage. This word comes from an older word meaning to carry. When the river was very swift or full of rocks, the Indian took his

canoe out of the water and carried it along the bank until he came to quiet water. Then he put his canoe back in the stream again.

In times of peace the Indian tribes traded with each other. They packed up the furs or tobacco which they did not need and set out in their canoes. They went down the streams or across the lakes. If they had to make a portage, they carried their load as well as the canoe. Other tribes brought grain or shells to trade for the furs or tobacco. When all the goods had been traded among the tribes, the Indians packed up their new load and got into their canoes and started home.

In times of war the Indians guarded their trails and portages. They sent scouts to watch along the trail and the banks of the stream or lake. These men hid in the woods and brush and did not let the enemy know they were watching. If the scouts saw enemy Indians coming, they shot arrows at the enemies.

When the Indians were at war, they traveled on trails where there were good hiding places. They waited in thick bushes or behind rocks until the enemy tribe came that way. Then they took

careful aim with bows and arrows and shot. When the other tribe saw that their warriors were falling, they sometimes disappeared into the woods and fled back to their homes.

If the Indians had to pass through the enemy country, they went on trails where their footprints would not show. Sometimes they walked in the shallow water of a stream. Often they walked over bare rocks. Then the other tribe would not know that strangers had passed that way.

At other times the Indians did not know where the enemy was. So they followed a trail that went close to the top of the ridges. They were up so high that they could see a long way off. They watched in one place a long time to see whether anyone might be moving in the valley or on the slopes.

Some places along the trail were steep. In such places the Indians had to scramble up. When night came, they camped in an open place along the trail. But guards kept watch all night, for enemies could easily see their camping place. You can see that, when white men came to this country, they found many Indian paths.

ROADS MADE BY THE EARLY WHITE MEN

A long time ago Sam Hunt and his family lived in a log cabin. The cabin stood in a clearing which he had made in the woods. Sam liked to go hunting to get meat for his family to eat. One day he took his gun and hatchet, said good-by to Mrs. Hunt, Prudence, and little Sam, and started toward the woods. It was a bright, sunny day.

Mr. Hunt cleared away the fallen branches as he went along the narrow trail. In some places the vines had grown from bush to bush and he could go no farther. He had to cut his way through.

Before long Mr. Hunt saw a deer bounding through the forest. He took aim and shot. But the deer had seen him and ran away before he could shoot again. Sam was sorry that he had used a bullet without hitting the deer. It was not often that he missed.

Sam followed the trail as it twisted between great

tree trunks. The ground was so shaded that no grass or bushes grew there. After a while Sam came out into an open place where there were large rocks. The trail went around these rocks, for the Indians always took the easiest way.

Then Sam killed some rabbits and squirrels and tied them to his belt. But he kept on going hoping to get a deer.

Suddenly Sam caught sight of an animal moving along among the trees. It was a bear, a big bear with thick brown fur. The bear did not see the hunter and stopped to eat some berries. Sam kept very still, but he quietly drew his gun. Then he shot at the bear, and it fell.

Quickly he drew out his hunting knife and skinned the dead bear. He cut out the best parts of the meat and put them in the bearskin. The skin would make warm covers for winter. Then Sam swung the heavy load up on his shoulder. It was almost as big a load as he could carry. At last Sam was ready to start home.

Since the trail wound about, Sam had a long way to go. Once a branch of a tree hit against his bear meat and knocked it off. Sam stooped and



picked up the load again. His arms were tired. How he wished that there were a good road through the forest! If the road had been wider and straight, it would have been easier for him to get home. But he tried to forget how tired he was and to think how glad his family would be when he returned.

As the sun got lower in the sky, it began to grow dark in the woods. The thick trees kept out the light. Sam hurried along to get home before dark. Suddenly the trail looked strange, and he wondered whether he was lost. Soon it would be so dark that he could not see his way. Wild animals would smell the fresh bear meat and follow him.

Then he saw a place in the trail where he had torn some vines down. He knew that home was not far away.

In a few minutes Prudence and little Sam and Mrs. Hunt came running to meet him. Soon he was in the cabin with his family.

Mrs. Hunt quickly skinned a rabbit and cut it up. She put the pieces of meat into a kettle of water and hung it over the blaze in the fireplace. The family would soon have a good stew.

The Hunts and their neighbors knew that they needed better roads for themselves and their horses which carried loads. There were not enough roads, and most of them were narrow and rough. So one morning all the men took their axes and went into the forest. They cut down trees and bushes so that two or three people could walk side by side on the trail. They moved rocks out of the way so that the road would not wind around so much.

After many miles the trail led to a swift little stream of water. There was no bridge over this stream but only a log on which the Indians had walked. A few of the white men who wore moccasins crossed on this log, but the men who wore shoes slipped and almost fell into the water.

Mr. Hunt and the other men decided this was a good place for a bridge. They saw three tall trees close by and cut them down. They made the trees fall across the narrow stream near the first log. They rolled the logs close together to make a wide bridge for them to walk on. Now they would not have to swim across the stream or paddle across it in a canoe.

The early settlers had a hard time traveling in our country. Sometimes they spent hours cutting their way through bushes and canebrakes. If the trail was steep and rocky, the horse might stumble and fall. He might throw off his rider or the load on his back.

Because it was so hard to go from place to place, the women and children stayed at home most of the time. They were always glad when other families came to live near them and be neighbors. Though the men went on hunting trips, they did not often see people who lived far away.

While the men had wagons they had built, they could not use them all the time. Many roads were too narrow for a wagon. Some roads were so rocky and rough that a wagon could not travel over them. Sometimes after a rain the wheels sank down into the mud and left deep ruts, or furrows. When the mud dried, the road was rougher than ever. Often after a rain men could not go along the road on foot or even on horseback.

To keep heavy wagons from sinking into the mud, the men learned to lay logs across the road. They placed the logs close together. The road

was very bumpy when the wagon went over it. These roads were called corduroy roads. See whether you can find out why.

When men began building better roads, they wanted to get back the money they had spent in making the roads. They also needed money to take care of the roads. So everyone had to pay money, or toll, at certain places along the way. These roads were called toll roads. Usually the toll was five or ten cents from one tollgate to the next.

Often a toll had to be paid for crossing a bridge. Some of our new bridges today are toll bridges. You must pay toll when you drive across them in a car or truck.

Sometimes the farmers worked on the roads near their homes, for they wanted their friends to be able to come to see them. They scraped the dirt toward the center of the road so that the rain water would run off easily. After a rain they dragged a heavy log over the soft road to make it smooth. In some places they broke up rock and covered the road with crushed rock. In parts of our country today men take care of unpaved roads in the same way.



AN AUTOMOBILE TRIP TODAY

Mr. and Mrs. Tucker had promised to take their son John on an automobile trip as soon as his school closed. The very next Monday morning they started out on their vacation trip. Mrs. Tucker took the seat beside the driver, and John got into the back seat. Mr. Tucker put two suitcases and a basket of lunch in the back of the car. Then he opened the door on the driver's side and got in behind the steering wheel.

Mr. Tucker drove along side streets until he reached the edge of the city. Here they came to a wide highway. There were trees on both sides of the road, and there were only a few houses here and there. Off in the distance John saw a bridge.

As the Tuckers went farther on, they came to a place where a man was working on the road. He was painting a white line down the middle of the road. John's father said that this line told drivers

to stay on their side of the road. Then they would not get in the way of cars which were going the other way.

Soon John saw that the white line came to an end. But a narrow strip of grass was planted down the middle of the road. On each side of the grass there were three lanes for cars. John's father said that it was easy to drive on this wide road. He said that many people used this road, and it was safer for cars going in different directions to be separated. The slower cars or trucks keep to the outside lane, and the faster cars keep to the inside lanes.



At noon the family came to a park where people could stop and eat their lunch. Mr. Tucker got out the lunch basket and carried it to a table just off the road. It was a long table with a bench on each side.

Mrs. Tucker spread a bright paper tablecloth and put down three paper plates. She laid a wrapped sandwich on each plate, opened a jar of pickles, and poured out John's glass of milk.

All of the Tuckers were hungry and took some more sandwiches. Then Mrs. Tucker brought out some hard-boiled eggs and a salt shaker. While John ate his third sandwich, she opened another box and showed the cup cakes they would have for dessert.

When they had finished eating, John picked up the papers and boxes and put them into a big can in the park. Mrs. Tucker saw that the table and benches were clean before she left them. Mr. Tucker took the lunch basket back to the car. A few sandwiches were left in case anyone got hungry during the afternoon.

Beyond the park the Tuckers came to an old part of the highway where there was only one lane

each way. Mr. Tucker said that he would be glad when that part of the road was made wider to take care of the heavy traffic.

At the roadside were signs which told drivers about the road ahead. What does the sign in this picture say? Just a little beyond there is a sharp turn in the road. A good driver will go slowly around this turn. Mr. Tucker drove slowly when he saw this sign.

After a while the Tuckers came to a sign which read "School—Drive Slowly." Mr. Tucker slowed down again. In a short time John saw a country





school near the road. Since children might cross the road, the sign told drivers to be careful near the school.

Late in the afternoon Mrs. Tucker said that it was time for them to find a place to stay all night. They must sleep and get rested so as to get an early start in the morning. In a few minutes Mrs. Tucker saw a sign that said an auto court was just ahead. John watched until he saw many little houses set back from the road among trees. Mrs. Tucker said that she liked the looks of the court. So Mr. Tucker drove into the yard and stopped at

the office. A man came out of the office and showed the Tuckers the cabin which they might have. Mr. Tucker drove his car into the parking place beside this cabin. Then Mrs. Tucker went in to see the cabin first. She thought that it would be a good place to spend the night.

Mr. Tucker paid for the cabin and gave the man their names and the license number of the car. Then Mr. Tucker brought in the suitcases. The tired family was soon asleep.

The next morning the Tuckers left early and drove along the road you see in the next picture. On one side there was a deep valley. Mrs. Tucker said that she was glad the road builders had put up the row of white posts. It seemed safer to have them there, for they reminded the driver to go carefully. Mr. Tucker said the posts showed up well at night and made the road safer.

Before long Mr. Tucker told John to look for a filling station on their side of the road. He needed gasoline. He stopped at the filling station which you will see after you turn the page. The man who ran the station told Mr. Tucker that at the next filling station there was a lunchroom where





they could get breakfast. Many people stop every day at this filling station, and the man likes to talk to them.

By the time the Tuckers had reached the lunchroom, the drive in the morning air had made them hungry. The smell of frying ham and hot coffee was in the air when they drew up and parked beside the building. The room was filled, but soon there was a vacant table. The Tuckers had a good breakfast and then started on their way again.

Mr. Tucker said that today they would reach a big city. He drove fast on the wide road, and John and his mother said nothing for a long time. They liked to look at the little towns and the country which they passed through.

Just before they came to the city, Mr. Tucker drove across the bridge which you see in the next picture. A wide river flowed under the bridge. The car ran smoothly over the bridge. Mr. Tucker said that driving across the bridge was just like driving along a good highway.

He drove carefully through the city. There were so many people at the crossings and so many automobiles and trucks on the streets that he had to be careful. Signs told him how fast he could drive. He watched the "Stop" and "Go" signals at corners where no policeman was on duty.



That night John and his father studied the map and decided which way to go the next day. John could hardly wait for morning to come.

HOW ROAD MAKING HAS CHANGED

THE LAND

The land we live in looks different today from the way it looked when the first white men came to our country. In the early days roads were so muddy after a rain that wagons could not travel, and men on horseback had to go very slowly. But today in a heavy rain a wagon or an automobile does not sink down into the road. Our highways are made just a little higher in the middle than at the side. Then the rain water runs to the edge of the road.

Most of our roads are straight and have few sharp turns. The men who made the roads cut down hills. They filled in swampy places and little valleys. They cut down trees and bushes and took out roots, stumps, and rocks. They built bridges over streams and deep canyons. They made tunnels through hills. They built overpasses, or bridges, over railroad tracks so that automobiles

and other vehicles would not have to cross them and run the risk of being hit by a train.

In the eastern part of our country many of the roads follow the routes of the Indian trails. But the roads are wider. They have been made into good highways and are taken care of.

Today in some parts of our country there are dirt roads where few people travel. These roads can be kept smooth and level. The farmers living near by need good roads so that they can drive their cars or trucks to market.

When you see a narrow trail, you may be sure that it is not often used. Sometimes a trail will lead to a house standing alone in the woods. But every house has a trail or road near it which leads to a larger road. This road leads to a wider road which goes to a big city.

Near a big city many roads come together and lead to the city streets. These roads come into the city from all sides. Usually the roads near a big city are wide, for many people drive over them every day.

Because we have good roads, people who live in the city can travel quickly into the country. They

can enjoy the woods and lakes. They can visit beaches and parks far from home. As they drive along the road, they can buy from farmers at roadside markets.

People who live on farms can also travel quickly on good roads. A farmer can go to the city and sell his eggs and cream before they have spoiled. When cold weather comes, the farmer and his family do not have to stay at home on the farm all winter long. They can go to the movies and buy at the stores in town. They can go to different towns that are close by, and they can visit their friends. It is much more pleasant to live in the country now than it used to be before good roads were built all over the land.

Some roads follow a trail that people just happened to make. It seemed the easiest way for them to go. Maybe you have seen near your home a lot without a house on it. There may be paths which people have made by walking across the lot.

Most of our good roads today are planned. Before the road was built, a man called an engineer decided which way it should go. The engineer

found out where roads were needed. He planned to make other roads near by and knew the best places for the roads to cross.

Today roads have been built in all parts of our country. If you could go high enough in an airplane to see all the country at once, you could see that roads have been built across our deserts and plains and mountains and through our forests and along our coasts. There is no longer any large part of our country that is not reached by roads. Our roads today are straighter, wider, and harder than the early roads were.



QUESTIONS AND THINGS TO DO

1. Make a list of all the ways you have ever traveled. Did you travel over land or water in each of these ways?

2. How are paths made over the earth?

3. Tell about the kinds of trails which the early white settlers found when they came to this country. Tell how these trails had been made and where the trails led. Was it easy or hard for the settlers to travel over them? Why?

4. How did the settlers make roads for themselves and their horses?

5. How are our roads of today different from those of early times? Are there more or fewer roads today? Where do they lead? Who uses the roads in our country?

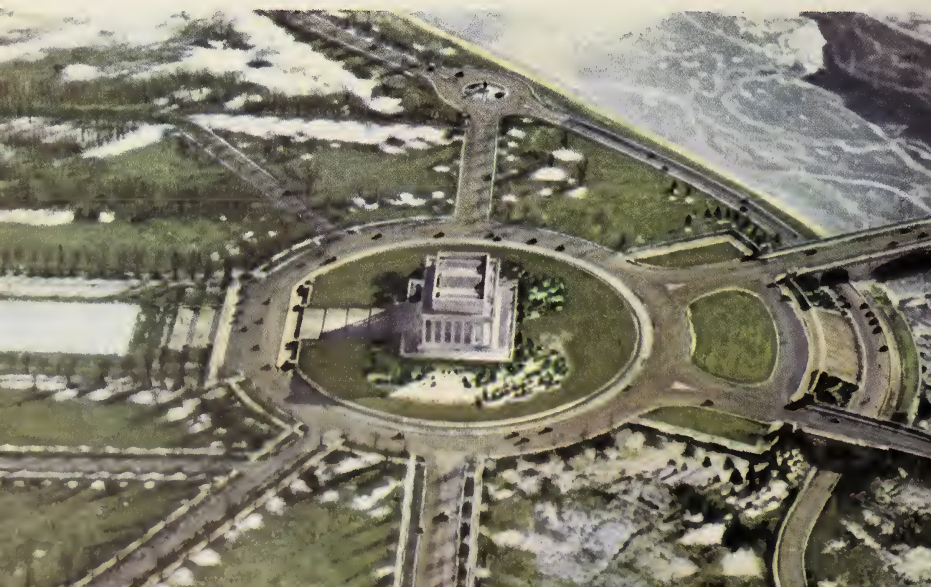
6. Name everything you can which helps to make our roads safe for automobiles. Remember the line painted down the middle of some roads.

Remember the signs and the rows of white posts you have seen.

7. Find out whether the roads or streets where you live are good, fair, or poor. What difference does this make to the people in the neighborhood?

8. Is any work being done near your school which shows that people want good streets and roads? Are new roads being paved? Are old ones being widened? Are new traffic signs being put up? Are bridges being built?

9. Here is an airplane picture of part of a city. Draw a plan showing only the streets in this picture. Make big streets wider than the little streets. How many narrow streets have you shown? How many wide streets have you shown?



HOW A RAILROAD
CHANGED A TOWN



A VILLAGE BEFORE THE RAILROAD WAS BUILT

Over a hundred years ago there was a little village which stood in a small clearing on the banks of a creek. All around were low, wet lands and forest lands where wild animals lived. A road ran north and south through this village. There were several paths which led from house to house and on to the woods and marshes.

There were three mills in the middle of the village. In the old red mill the miller ground wheat to make flour. In another mill Mr. Horner sawed logs into lumber. It was called a sawmill. There was another mill which got oil out of seeds. Two of these mills were on the banks of the stream. Water was brought to the old red mill in a ditch. Three small bridges crossed this ditch.

Near the sawmill was a tannery where hides of animals were made into leather. There were also many houses where the people of the village lived.

In the afternoon the village boys used to go to the old red mill to watch while the big wooden water wheel turned and turned. They liked to see the bags of wheat, which the farmer brought, first weighed and then emptied into a huge box. They watched the grain being taken up in the elevator. They also watched as the grain was crushed fine into flour and was put into sacks for the farmer.

Sometimes the boys went to the stream near the sawmill. The logs which would be made into lumber floated in a millpond. The boys sometimes walked out on the floating logs.

Beyond the village there was a spring near the shores of a small lake. The water from this spring was not good to drink. Indians used to say that the spring had a demon in it which made the water bitter. But the water tasted bitter because it had so much salt in it. It came up through ground that was very salty.

Some of the people in the village worked to get the salt out of the water. They pumped the water up into shallow wooden tubs. They left the tubs uncovered when the sun shone. The warm air took up the water and left the salt in the tub.



The men did not want rain to get into the tubs and keep the salt from drying. So some of the men always watched the sky. When they saw dark clouds, they rang alarm bells. Then the men, women, and children all rushed to put covers on the tubs. They tried to finish before the rain came down and wet the salt. This was a slow but sure way of getting salt.

Two men who lived in the village thought it took too much time to get salt that way. They put the salty water into a kettle and hung the kettle on a pole over a fire built out of doors. The pole was held up by posts placed in the ground. The water in the kettle boiled away, and the salt was left. In this way the men quickly got salt.

Since many people in our country did not have salt springs near where they lived, the people in this village could sell their salt. Sometimes they sent Indians out to carry a bag of salt to a neighboring village.

The picture shows the village on the banks of the creek. Find the salt springs. Did the people in this village have to go far to get salt? Find the old red mill.

TRAVELING ON THE CANAL

A long, long way west of the village which you have been reading about there was a very large lake. A long, long way east of the village was a wide river. Large boats sailed on this great lake and on this great river.

Some of the people who lived in the village began to wish that there was a stream to join the lake and the river. Then they could go by water from the river to the lake.

Then somebody thought of digging a canal between the river and the lake. Men dug a ditch hundreds of miles long but only a few feet deep. It was wide enough to let boats pass each other. The men let water from the lake run into the canal.

The canal went through the village. Some houses and a store were on one side of the canal. On the other side were the mills and more houses. Two hotels were built for travelers.

Boats went back and forth along the canal. Some of these boats carried people and were called passenger boats. They were painted in bright colors—green, yellow, brown, red, white, and blue.

These boats moved slowly along the canal. At that time people did not know how to make a big boat go as we do today. Our big boats are made to go by steam. How do you think the boats on the canal were moved?

They were pulled by horses or mules. The animals walked along a path on the shore of the canal. They were fastened to the boats by ropes and were guided by a driver who sometimes rode on one of the horses. As the horses walked steadily along, the boat moved behind them. The horses could not pull the boat as fast as an automobile goes today. It took a long time to go from one end of the canal to the other. This canal was called the Erie Canal.

The passenger boats were low flat boats with many windows along both sides. Inside were small rooms where the passengers slept while they traveled on the boat. On top was a deck where the passengers sat or walked about in good weather.

There was a dining room where they ate their meals.

The children in the village liked to watch the boats go by. They saw the horses pulling hard against the ropes. The boatmen had long wooden poles to keep the boat away from the bank. Sometimes the boys and girls waved to the captain of the boat in his blue cap and brass buttons as he watched from the deck.

Other boats which went on the canal carried goods that people wanted to sell. Men who owned farms or forest land sent lumber, wheat, corn, and other things to the towns along the canal. The boats stopped at the village and unloaded part of the goods there. The village people sent barrels of salt to farmers and to stores.

More salt was made in the village because it could be sent away more cheaply than before the canal was built. More people came to the village to live. New stores and houses were built. Merchants came to buy things which were made in the village and to sell their goods. The village began to grow into a large town. But travel was still slow. In winter the canal froze over and boats could not pass through.

TRAVELING ON THE EARLY TRAINS

The town grew larger after canalboats began running. Then a railroad was built, and trains brought more people to the town.

The first railroad cars used in our country were drawn by horses. The cars had four wheels which ran on rails of wood. Before a person rode on this train, he bought a ticket. The number on the ticket showed which seat he was to have. When the conductor took up the tickets, he passed along on the running board of the car. See whether you can find out more about these trains which were drawn by horses.

Later the trains which came to the town you have been reading about were pulled by steam engines called locomotives. The passenger cars were made like stagecoaches, and people could sit on top of the cars. The freight cars were just like big boxes on wheels.



The engine burned wood. The smoke hurt the passengers' eyes and made their clothes dirty. The locomotive did not have a cab for the engineer and the fireman. They were not protected against rain and snow. In very cold weather they might be covered with snow by the time they reached the end of their trip. There were no whistles, bells, or headlights.

The locomotive and the coaches were held together with strong short chains. When the locomotive started or stopped, the chain jerked the coaches so badly that passengers might fall out of their seats.

There were several early railroad lines, but each went only a short distance. If a person wanted to travel far by train, he had to change cars many times.

But the trains went faster than the boats on the canal. Also the trains ran in winter when the canal was frozen over. Before long better railroads were built, and the canal was used only for shipping goods.

Since people could reach the town more easily, many families came there to live. The town which was called Syracuse grew into a city. Trains

brought corn, wheat, and other food to the city from big farms a long distance away. The farmers near the city stopped raising corn and wheat. They kept dairy cows and raised fruits or vegetables instead.

Every day the farmers who lived near brought milk and butter to the city. When their fruits and vegetables were ripe, they sold them to the city markets. They began to buy things which were made by people in the city. Factories in Syracuse made guns, candles, clothing, shoes, and other things. These things were shipped to the farmers by railroad.

As factories were built in the city, it grew larger and larger. The people grew busier and busier. The buildings were close together because the city people needed only enough ground to build their houses on and to have a small yard.

The railroad men had to buy wood to burn in their locomotives. They brought logs to a big woodyard. Many men worked to cut and stack the wood. When a train was ready to leave the city, the fireman had a big load of wood. Along the railroad track were yards where a train could

stop when its supply of wood was used up. Then men would load wood on the train.

A big station was built in Syracuse. Trains came there to let passengers off and to take on other passengers. Travelers came to this station when they were going to travel on the train.

A large shed was built for the locomotives. It was called a roundhouse because it was round in shape. There was an open space in the middle. Here a part of the track could be turned in such a way that a locomotive could run under any part of the shed. In the roundhouse engines were looked over and repaired after they came in from a trip.

There was little vacant land left in the city. The little village had grown large because the canal and the railroads made new kinds of work for the people. It was easy for the people to send away the goods which they made.

Today there are many small towns in different parts of our country where it is hard to build roads. If these towns are to grow big, they must have trucks and railways and airplanes to use for carrying passengers and goods. There must be plenty of work for the people to do who live there.

RAILROAD AND
PULLMAN TICKETS

NEW YORK CENTRAL
RAILROAD AND
PULLMAN TICKETS



A TRAIN TRIP TODAY

See Mr. Jenkins at the ticket window in a big railroad station. He is buying a railroad ticket to a distant city. The ticket man is stamping the date on the ticket.

Bill Jenkins is a businessman and has work to do in another city. Since he wants to be there in the morning, he is taking a fast night train.

Bill looks at the ticket to see that it is all right. Then he puts it in his pocket and turns away from the ticket window.

A porter wearing a red cap picks up Bill's suitcase and leads the way to the train. Bill passes into a room so huge that a very large store could be built in the middle of it. At one side of this room are sliding glass doors called gates. Some are shut and some are open.

Bill sees people coming through one of the gates from a train that has just reached the city. He

watches as a man stops at the parcel room to leave his suitcase. The man is waiting for another train and does not want to carry his suitcase while he goes out for a walk. He puts a dime down on the counter. The man inside the parcel room takes the money and picks up a ticket. He tears off part of it and hands it to the traveler. The other part he fastens to the handle of the suitcase.

On one side of the station is a large lunchroom. But there is not time for Bill to eat before his train leaves. Other people have a long time to wait for their trains and are eating dinner in the lunchroom.





Bill and the porter, who is carrying the suitcase, reach the gate to the trains. Bill shows his railroad ticket to the man at the gate and passes through to a long, wide platform. The porter follows with the suitcase.

On each side of the platform stands a train ready to leave. Bill sees by an electric sign that his train is on the track to his left. The back end of the train is nearest the gate. The end car is called an observation car. Here people are already sitting in easy chairs and reading or watching the people come to their train.

The engine is at the front end of the train, ready

to start when the signal is given. Bill knows that the engine has a bright headlight which will throw a light down the track.

The outside of the train is smooth gray metal. As Bill walks along, he looks for the card in the window at the end of each car. The card has a number on it. When he comes to the right car, he shows his ticket to the man at the steps.

The porter carries Bill's suitcase into the train. He finds the room which has the number marked on Bill's ticket. The porter puts the suitcase under the seat, and Bill gives him a quarter for carrying it. Then the porter goes back into the station to help other people to their trains.

Bill is hungry, for it is past his dinnertime. He goes into another car called the diner. He is led to the table which you see in this picture. The waiter puts down a folded white card on which there is a list of the foods for dinner. He gives Bill a slip of paper and a pencil. Bill looks at the card and then writes down on the paper what he would like to have. He does not have to wait long before the waiter brings his dinner. The train moves slowly out of the station as Bill starts to eat.



When he has finished eating, he goes to the lounge car. It has comfortable seats where the passengers sit while they talk or read. There are a few desks at which people sit and write letters.

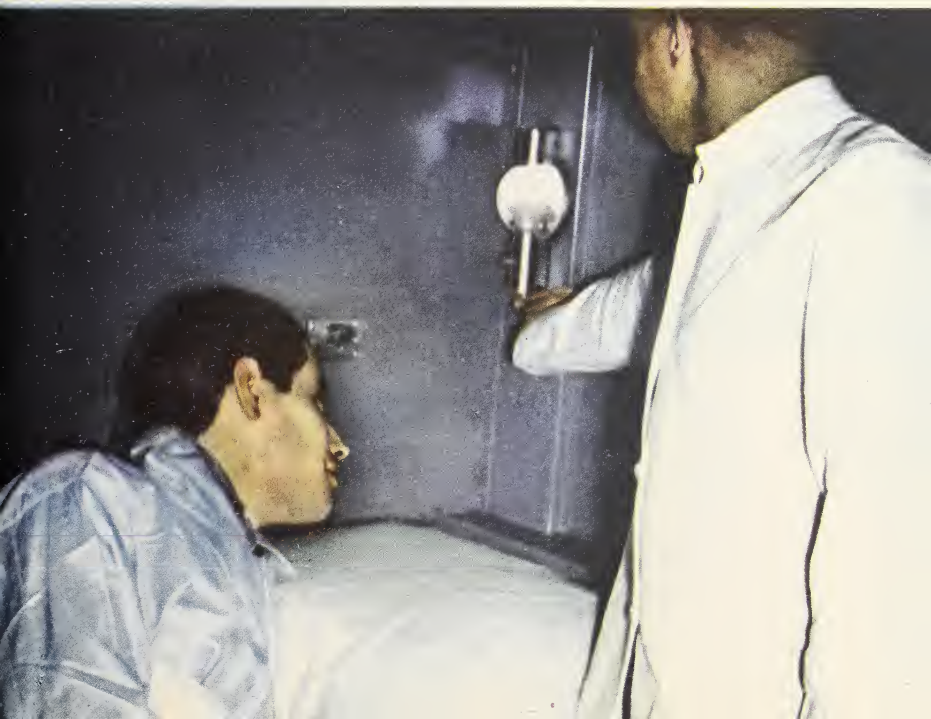
The windows of the cars are kept closed even when the weather is warm. Inside the cars the passengers are comfortable, for the train is air-conditioned. This means that in hot weather the air is made pure and cool before it is let into the car. In winter the air is heated. Bill likes to rest and read in the lounge car in the evening until he gets sleepy.



What is Bill doing in this picture? See the train porter. He makes the beds for the people in his car and sees that the passengers are comfortable.

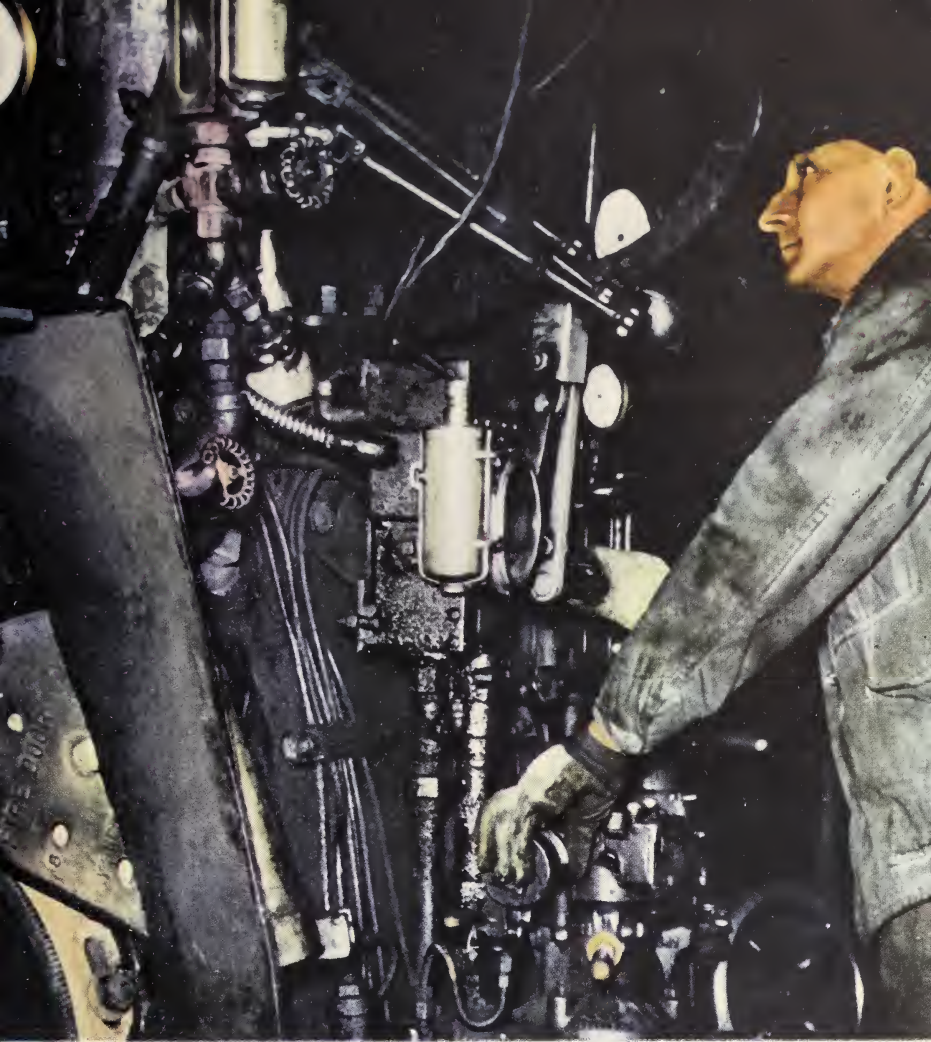
Bill asks the porter to call him at half past six the next morning. Then he gets into bed and sleeps comfortably all night.

In the morning the porter wakes Bill up. He dresses and packs his suitcase and is ready to get off the train when it reaches the station in the city. There a porter steps up to carry Bill's suitcase and to take him to a taxi.





This is the engineer who brought Bill's train into the station. He is looking out the window to see the signals along the road. He cannot see



the track just in front of the locomotive. But he can see a long way ahead on the track.

The little room which the engineer works in is

called the cab. The fireman works in the same cab. He must keep a hot fire burning in the engine so that the engine can pull the long train. The engine burns coal.

Today many fine trains like the one which Bill Jenkins rode on travel between our big cities. They go very fast and travel many miles in a few hours. They run day and night. People like to travel on a fast train. They often buy their tickets days or weeks ahead of time so that they can be sure to have a seat on the fast train.

As soon as the passengers leave the train, the cars are cleaned and made ready for the next trip. Even the windows are washed. The porter of each sleeping car gets enough clean sheets and pillow slips for the next trip.

Today passengers can travel a long way without changing cars. They can sleep well and be rested when they reach the end of their trips. For this reason people today travel more and see much more of the world than did people of early days.

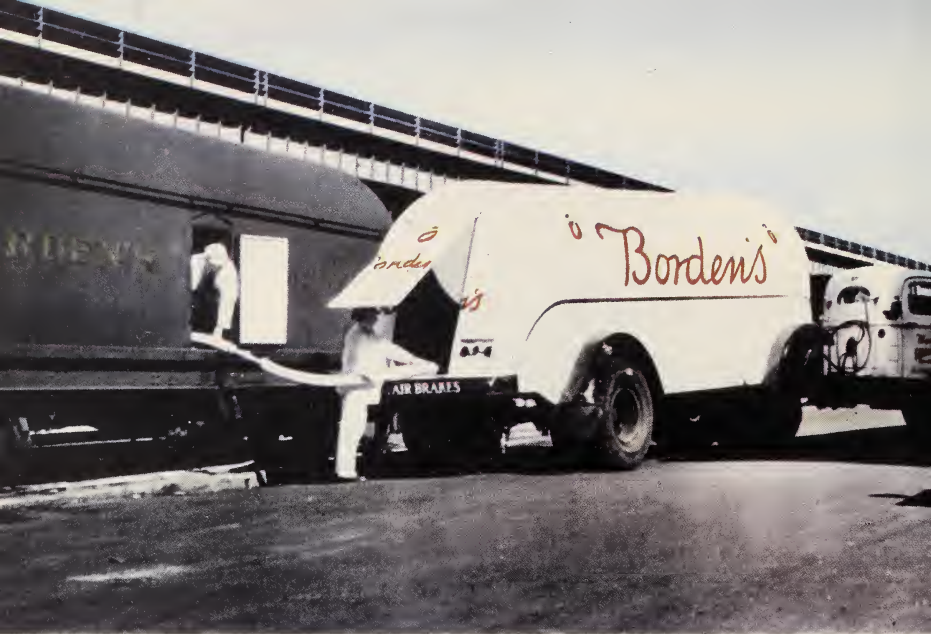
FREIGHT TRAINS OF TODAY

Wherever you live, fast trains bring you food and clothing from distant places. They bring milk and eggs and meat, fruits from the orchards, and vegetables and grain from the farms. If you live in the cold north, you may have strawberries when there is deep snow on the ground. If you live far from the coast, you may still have fresh fish from the sea.

Fruit, vegetables, and meat are shipped in refrigerator cars so that they will not spoil. Ice is kept in tanks at the ends of these cars, and fans move the cool air through the cars. In winter the car may be heated to keep fruit or vegetables from freezing.

Refrigerator cars are pulled by big engines. Such cars move fast to reach the market while their load of food is good.

Milk is often shipped in tank cars. See the



men unloading milk from this big tank car. They are pumping milk into the milk truck. Some of the milk will be put into quart bottles and sold in stores. The tank car holds enough milk to fill thousands of bottles.

There are other kinds of railroad cars which carry food. There are also railroad cars which carry automobiles or furniture or boxes of clothing or shoes. A car which carries food or some other load is called a freight car. The load it carries is called freight. The car in the next picture is a box car. What kind of freight is shipped in it?

Some cars are used to ship cattle. On a long trip the cattle are unloaded for water and food. The cars in which the cattle ride are called cattle cars. Cars having an extra floor halfway between the top and bottom carry hogs and sheep because these animals are not tall enough to need so much space.

Freight trains are often long. Fast freights carry fruit and green vegetables to the big cities. If the railroads did not run, people in the cities would soon be without food. The food which is really in a city at any time would last only a few days.

Towns have grown into big cities because more



people have come to work there. Cities have big factories where machines, clothing, and other things are made. Such goods are shipped by railroad to people who live on farms, on ranches, and in other cities.

See this city where many railroads meet. The railroads bring many passengers and much freight into the city. Some of the freight is taken to ships and sent across the ocean. The men who ship the goods have their offices in big cities like this. They buy and sell for men who grow the food or make the goods in other parts of the country.



QUESTIONS AND THINGS TO DO

1. How did the Erie Canal help the village people to sell more salt?

2. Tell why Syracuse grew larger and larger after the railroad was built. Maybe you know why passengers liked to travel by train rather than by canalboat. Maybe you can tell what the trains brought to the city and what was done with the goods made in the city. Also tell what new buildings were put up.

3. Visit a railroad station and watch a train come in. Notice the headlight and the whistle. Watch the railroad men get off when the train stops.

4. Watch a freight train and notice the kinds of cars. Look at the names of the railroads painted on the sides of the cars.

5. Ask a railroad man to tell you about his work. Then tell the class what you have learned.

6. If you have been on a sleeping car, tell what it is like.

7. How is a railroad passenger car different from a streetcar?

8. Make a list of all the kinds of railroad cars about which you know. Begin your list with refrigerator cars.

9. What difference would it make to city people if the railroads did not run?

10. Draw or paint pictures for a scrapbook about railroads.

11. In some parts of our country there are many railroad lines and in other parts there are few. In which parts would you expect to find more cities?

12. What is meant by these words: canal, freight, passenger, porter, locomotive, roundhouse, parcel room, air-conditioned?

13. Watch railroad signals work. Try to learn what each change means.

14. Visit a building that is air-conditioned. Are the windows kept open or closed? Why?

15. Help your teacher make a list of some of the ways in which our land has been changed by railroads.

16. Which of these changes are happening or have happened where you live?

HOW THE LAND
HAS BEEN CHANGED



THE CHANGING EARTH

The stories in this book have told you about the changes which have been made in our land since white people first came here. Many changes have been made by animals too.

The beaver is one of these animals. He lives in a lodge, or house, with quiet water around it. If he has to live in a river, he builds a dam of logs and mud across the stream. Below the surface of the water, he digs a tunnel through the wall of the lodge. Then he can get food in the water or on land.

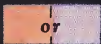
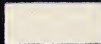
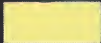
After a beaver dam is built across a stream, the water rises higher above the dam. If it stays high, it may spread out over the land and kill the trees that are standing in the water. Forest rangers often have to tear out beaver dams to keep a stream flowing and to protect the trees and to prevent the flooding of farm lands.

Lightning also makes changes in the land. When lightning strikes in forest or brush land, it may start a small fire which spreads into a big forest fire. Large trees may be burned, and young trees may be killed by the fire. Do you know any other ways in which fires are started and change the land?

After a fire has burned away the trees and grass on a hill, there is nothing to hold the water in the ground. The rain washes away the soil. Then trees and grass cannot grow there. Big rains fill the rivers and lakes. If much water falls, it spreads out over the land. It washes houses away and kills the animals and crops. You can see what bad changes fires make in the land.

The earth is changing all the time. But many of the changes are made very slowly. There is still a big body of water in the world which is divided into parts by the continents and islands. There are still the same big continents with water all around them. The big islands are still there. In some parts of the ocean, land which was once under water has been pushed up above it. So today there are some small islands that once could not be seen.



 or 	Desert		Forest		Ice
	Farm land		Grassland		Water

People have been cutting down trees and digging in the earth for many years. But they have touched only a little of the earth. Changes are going on



in parts of the earth where few men have been. Our earth is so large that there are great parts of the land where man has made no changes.

CHANGES IN ANIMALS

Many of the wild animals in our country have disappeared since white men came to live here. Wild turkeys, mountain sheep, and deer once were seen in large numbers. But now there are few of them left because hunters have killed them. If you want to see elks or buffaloes now, you must go to a zoo or to a park kept for wild animals. There are many such parks to be found in different parts of our country.

One park for wild animals is in a cold part of our country where there are high mountain ridges. Herds of buffaloes and elks are kept in this park. In the winter the buffaloes stay in a valley between the high ridges. The elks stay on the slopes covered with pine trees. Often these wild animals find enough food for themselves all winter. They use their hoofs to dig the snow away so that they can get the dry grass on the ground. But when there

is not enough food, the men who take care of the park throw hay out on the snow for the animals to eat.

The animals in this park are protected from hunters. Nobody may kill them. Visitors go to the park to see these wild animals.

Some kinds of fish which lived in the rivers and ocean are gone. But there are some rivers and lakes which still have the same kinds of fish as in the time of the Indians. Men are raising young fish and putting them into the rivers and lakes. We hope we shall always have plenty of fish in our streams and lakes.

From the stories in this book you know that people brought animals here which were not wild. The early settlers brought cattle, sheep, and pigs from other countries. Then the settlers could have meat and milk for food and leather and wool for their clothing. White men also brought oxen to plow with and to pull heavy loads. They brought horses too to carry loads and to pull wagons. White men liked to ride horseback. So did the Indians, but there had been no horses in our land until white men brought them.

CHANGES IN TREES AND PLANTS

Men have changed the plants which grew in our land. As you know, forests in many parts of our country have been cut or burned down until only tree stumps are left. In some places men cut down the trees to get logs for building houses and boats. They left the ground bare.

Where few trees or bushes were left, rain water often rushed down as a flood. It washed away good soil where trees had grown. After the rain was over, weeds came up among the tree stumps. The forests which were cut down had been growing for thousands of years. It will take a long time for the trees to grow again.

In some places men cleared the land to make farms, pastures, and towns. They let their herds graze so long on pasture land that some kinds of grass have disappeared. But people have learned to plant new grasses and bushes and to set out



new forests. They have learned to cut down only the big trees of a forest and to leave the saplings to grow into large trees.

CHANGES IN THE SOIL

Men have used the soil over and over to raise the same crops. So some soil which was once fertile is no longer good soil. It does not have enough plant food to grow crops.

In some places farmers have put fertilizer into the soil to make it rich again. Sometimes they have planted a crop of clover or alfalfa. When the crop has grown, they have plowed it under. It has decayed and given food to the soil.

As you know, some of the soil on hilly lands has been washed away. Gullies have been made in the land. Some of these gullies are so deep and make the land so rough that it cannot be plowed. In the early days when land failed to grow good crops, the settlers moved on to the new lands. But today there are few places in our country where the land has not been used. So men have learned to take better care of the land.

Men plant grass and other crops to keep the rain water in the ground. They have learned not to plant their crops in rows that go straight up and down the slopes. When they plow the ground, they leave grassy strips in places where gullies might be cut in the soil by rain water. On sloping ground they plant strips of grain between the rows of corn. Thus they keep the soil from washing away.

Bare dry soil has blown away in places. Sometimes after fields have been plowed, there is not enough rain for seeds to be planted. If strong winds come up, the loose dry soil will blow away.

Where the soil is rich but dry, farmers have learned to irrigate it. They have brought water to the land through ditches or pipes. They have used sprinkling irrigation for vegetable gardens and orchards. If the dry land had not been irrigated, it would not have raised crops.

Some soil is wet and swampy. Men have learned to dig ditches in this land and let the water run off. Sometimes men have put pipes in the ditches and then filled the ditches up with soil. The water runs through the pipes and flows away. Then all the ground can be used for crops and trees.

CHANGES IN WATERWAYS

The lakes and rivers are not exactly the same as they used to be. Dams have been built to hold back the water. Behind the dam the water gathers in a big lake. Some of these dams are very, very high and have thick concrete walls. Concrete is not the same as stone but is made of sand, gravel, and cement.

Some dams have been built to keep the water from flowing over the land below. If rain water rushes down over land where people live, it may wash away their houses. It may flow like a river over their fields. The dam keeps the water from flooding the land. The water can be let out a little at a time. Then the rivers never get so full that they run out over the land.

Other dams have been built to hold back water until it is needed for irrigating the land. The water is kept in a lake until the farmers want to

use it. Then, as you know, it is brought down through pipes to their farms. Without the water the farmers could not grow good crops.

Men have also built canals. A canal often joins rivers or lakes. Then people can travel farther by water and can send their goods farther. Today there are a few places where canals connect one ocean with another. These canals have been dug through the narrow strips of land between the two oceans. Ships which use these canals do not have to make a long trip by sea to reach the other side of a continent. The ships can carry goods and passengers quickly to the other side.

In some places land has been built out into the water to make new parks or driveways along rivers or lakes. Trees and grass have been planted on the new ground. People can drive from one end of the city to the other on these beautiful driveways. Have you ever seen such a driveway?

Sometimes long wharves have been built out into the ocean. Men build them out of lumber, stone, concrete, or other material. Then ships can come and unload their goods and passengers at the wharf.

CHANGES IN WAYS OF TRAVEL ON LAND

At one time it was hard to travel across our continent. The mountains were like walls which shut off the land beyond. Only a few Indian and animal trails went through the mountains.

But men have made roads which take the easiest way through the mountains. These roads are wide and smooth and hard. Men have cut down steep hillsides to get a level roadway. Tunnels have been dug through steep craggy mountains or under rivers. Where a deep canyon or river is to be crossed, bridges have been built.

Where the road runs alongside a deep canyon, strong fences have been built. The fences are often painted white so that they can be easily seen. They warn drivers of the danger of going over into the canyon.

As people travel over a road today, they meet other roads. They can go through the mountains

in several different ways. On these smooth roads their automobiles can travel long distances in a single day.

Cities have been built on the plains and in the hilly lands. Highways and railroads come to these cities. As a traveler comes close to a city, he will see many roads leading to it. The roads meet at the city.

Where the owner does not want people to pass over his land, he has built fences. Fences keep animals from straying away from the owner. Why has the field in this picture been fenced in?



BUILDING ON THE LAND

Before white men put up buildings, there were only wigwams and Indian huts in our country. Now there are farmhouses, barns, city homes, office buildings, factories, churches, schools, railroad stations, and many other buildings. These buildings are on land where wild animals once lived and had their homes.

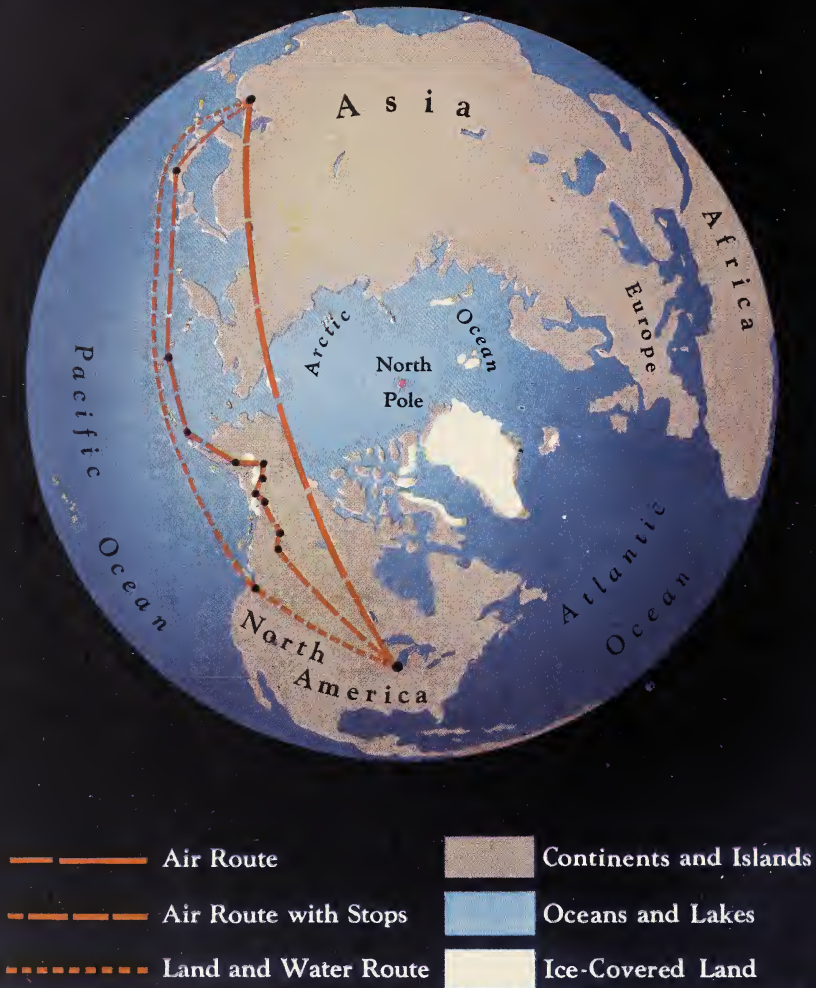
At first men cut down trees to get space for their houses and to get lumber to build with. In some parts of our country they took stones from fields to build houses and barns. They found places where iron was in the ground. They learned to use this iron to make steel for nails and machinery and frames for tall buildings. Men learned how to take rocks called limestone out of the ground and make them into cement or concrete. They used concrete for large buildings, bridges, and streets. What does a concrete sidewalk look like?

NEW USES FOR OUR ATMOSPHERE

You have been reading about the land and water on our globe. All around the earth is the atmosphere, which is the whole body of air. Once men used the atmosphere only for the air they breathed. Now they use the atmosphere in new ways just as they have found new ways to use the land and the water.

Today we see airplanes flying back and forth in the air. Many of these planes carry huge cargoes. Other planes carry passengers as well as cargo. Day after day many planes fly over the same airway. Men travel through the atmosphere in flying from place to place.

Men have built big airports on the land with runways which planes use when they take off and land. Beacons have been built to guide the pilots in the sky at night. To make the planes men have built big factories on the land.



As airplanes fly through the air, they follow short routes over the water and land, even over high mountains. You can see such air routes in this picture.

Today men fly swiftly in planes from one country to another. They can see and talk with people in any part of the world.

A person riding in a plane can often look down and see the earth. He can see the mountains, high hills, and level lands. Often he sees rivers and lakes and sometimes the ocean. From a plane he can see much more of the earth than he can see when he is on the ground. The earth is spread out below him.

Far above the earth, the atmosphere is so thin that there is not enough oxygen in it for a person to breathe. But men have learned to take tanks of oxygen in their planes. An aviator may wear a mask which has a tube that goes to an oxygen tank. He turns the oxygen on and breathes through the tube.

Today planes can fly so high above the earth that you cannot see them. Six or seven miles up above the earth, the weather is never stormy. The planes can travel fast.

Once men thought mostly of what was going on on land and water. But today all of us think about what is happening in the air.

GOOD CHANGES AND BAD

Some of the changes in the land have made our country a better place to live in. It was a good change when water was brought to dry land so that orange trees could grow there. Roads across the land help people to go easily from place to place. Then the people who live in one village or town are not shut off by themselves. They can have food raised in other places. Tell of some other good changes in the land.

Sometimes men have been wasteful in using the land. They have burned down fine forests because they forgot to put out their campfires. Sometimes men have not known how they were changing the world until it was too late. They have caught so many salmon that few were left to lay salmon eggs. They have cut down more trees than they used. Sometimes they cleared land which was not good for farming. Name some other changes which are bad.

QUESTIONS AND THINGS TO DO

1. Tell how changes are made in the land by animals; by lightning.

2. Make a list of kinds of wild animals that have largely disappeared since white men came to live in our country.

3. What happens to the bare ground after all the trees and bushes are cut down?

4. Draw a plan to show how crops should be planted on a slope. Should the rows of crops go straight up and down the slope or across it?

5. Why are people in our country trying to save our forests?

6. What would happen if our supply of iron should give out and we could not get any?

7. What kind of land must be irrigated to grow crops?

8. What can men do to wet, swampy soil so that it will be good for growing crops and trees?

9. How do we use stones and rocks?
10. Make a class list of several kinds of buildings which white men put up after they came to our country.
11. What kinds of land might you see if you were in a plane and could look down upon the earth?
12. Tell the meaning of each of the following words: dam, canal, concrete, tunnel, canyon, atmosphere.
13. Find five or more pictures in this book which show good changes in the land. Make a list of the page numbers of these pictures. Study the pictures so that you can tell why these changes were good for the land.
14. Draw pictures of four kinds of animals which white men brought to our country. Below each picture write the name of the animal.
15. How have the lakes and rivers in our country been changed?
16. Be ready to tell the class a few ways in which the land near your school is being changed.
17. Are these changes good or harmful? Why?
18. What other good changes might be made in the land near your school?

THE WORLD WE LIVE IN





WHY WE HAVE DAY AND NIGHT

You know that day always follows night, and night follows day. But you may not know the reason for night and day. Perhaps you do not understand why the sun seems to rise and set. It does not really move across the sky, although it seems to do so. We know that the earth rotates, or turns on its axis, but we do not feel that we are moving.

The earth rotates on its axis from west to east. The light from the sun shines on the earth. When the light begins to shine on any part of the earth, the sun seems to rise on that part. When that part is turned as near to the sun as it can be, it is noon, or midday, at that place. When the earth is turned still farther, that part begins to go into the shadow. The sun seems to set, and night begins.

Perhaps you do not know that the sun is much larger than the earth. When we see it in the sky,

NIGHT



DAY

it looks small because it is so far away. The sun, which is shaped like a sphere, is many, many times larger than our earth.

The earth turns round and round on its axis, or the straight line on which it turns. We say that the earth rotates on its axis. The northern end of the axis is the north pole. The southern end is the south pole. The earth's axis is not really a line, but a make-believe one, like the equator.

As the earth rotates on its axis, the part of the earth turned toward the sun has day. The part turned away from the sun has night.

NIGHT



DAY

The earth always rotates toward the east. So the sun is seen first in the east. It is seen last in the west. It takes a whole day and night for the earth to turn all the way around. This is twenty-four hours. When it is day in the western hemisphere, it is night in the eastern hemisphere.

The earth always rotates at the same speed. It does not turn more rapidly one day than the next. No clock or watch keeps as good time as the earth does in turning on its axis. Men set their clocks by watching the stars which come into sight as the earth turns.

THE SEASONS

Every year we have four seasons. They are summer, fall, winter, and spring.

In summer the days are long, and the nights are short. At noon the sun is high in the sky. It is usually warm or even hot during the day.

In the fall the weather begins to get cooler. In the late summer and early fall farmers gather most of their crops. Some animals store away food for winter. Many of the trees begin to lose their leaves. The days get shorter and shorter. At noon the sun is not so high in the sky as it was during the summer. The shortest day of the year comes just before Christmas in the month of December.

In winter the weather is usually cold. Sometimes there are days which are very cold. In some parts of our country snow falls, and it does not melt for weeks at a time. All but the evergreen trees are

bare, and the farmers cannot do much work outside. But the days get longer, and each day the sun is higher in the sky at noon.

In the spring the snow melts, flowers appear, and new leaves begin to come out on the trees. The farmer begins plowing his fields and planting crops. The longest day of the year is in late June. Summer has come again.

The seasons are not the same all over our country. In the southern part the warm weather lasts longer than in the northern part. It is never very cold in winter, and the cold weather lasts only a short time. But in the northern part of our country the cold weather lasts for weeks and weeks.

The northern and the southern hemispheres do not have summer at the same time. When it is summer in one, it is winter in the other. The seasons are turned upside down.

Crops are grown in the northern part of our country mostly in summer. But in the southern hemisphere crops are getting ripe when it is winter in our country.

Near the north pole the weather is never warm. The days that we call spring days get longer and

longer until in June the sun shines all the time and there is no night. But it does not rise very high in the sky. Then the days begin to get shorter until in December the sun does not rise at all. The winter darkness lasts for weeks at a time.

Near the south pole, too, the weather is always cold. But there the longest days come in December when the sun shines all the time and there is no night. The land around the south pole is covered with snow, and the water at the edge of the land is covered with ice.

At the poles there are six months of sunlight in the summer season. Then there are about six weeks of twilight, or half light. Next come three months of night, and about six weeks of twilight. But when there is sunlight at one pole, there is darkness at the other.

Near the equator the seasons are much alike. The days are always about the same length. The sun rises so high in the sky that the weather is warm there all the time except up in the mountains.

Our country lies in the northern hemisphere between the equator and the pole. Only the southern part of our country is so close to the equator

that there is never any snow. There is no part of our own country where there is winter darkness or summer sunlight both day and night.

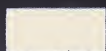
On the next two pages are pictures which show the western hemisphere. The first picture shows the land which is likely to be covered with snow in January. The other picture shows where there is snow in July. The white covers places where snow lies on the ground week after week. The gray covers places where snow may come a few times in the winter but melts quickly. Wherever there is green in the picture, there is almost never any snow during that month.

Let us look at the globe showing the western hemisphere in January. What part of North America has snow all winter long? Is there any part of this continent where there is hardly ever snow even in winter? When we are having winter, what season are the people having who live south of the equator?

Now look at the picture showing the western hemisphere in July. Is North or South America having summer? What parts look the same as they did in January? If you were having Christmas in

JANUARY

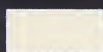


	Snow
	Sometimes Snow
	No Snow

the southern hemisphere, would the weather be warm or cold? Would the days be long or short?

Lands in the eastern hemisphere also have different

JULY



Snow



Sometimes Snow



No Snow

seasons. Near the equator are warm lands having no snow even in winter. But there are other places where the four seasons are like those in our country.

PICTURES OF OUR EARTH

The world is so large that we can take a picture of only a small part of it at a time. Because the earth is round, a globe can never show both sides of it at once.

If you were to go up in an airplane, the earth would seem to spread itself out below you. If you were to look down on trees in a park, they would seem like bushes. If you were flying very high above the park, the trees would look like thick, bunchy grass. A country road would be like a narrow light-colored ribbon crossing the land. In the country you would see many fields at a time. As you looked down on a sunny day, you might see a long winding line, which would really be a river.

If your airplane were flying low, you would see a very, very small part of the earth at a time. But you would see that part plainly because you would be close to it. You could see the trees, the houses,

the roads, the farms, and even the people moving about on the ground.

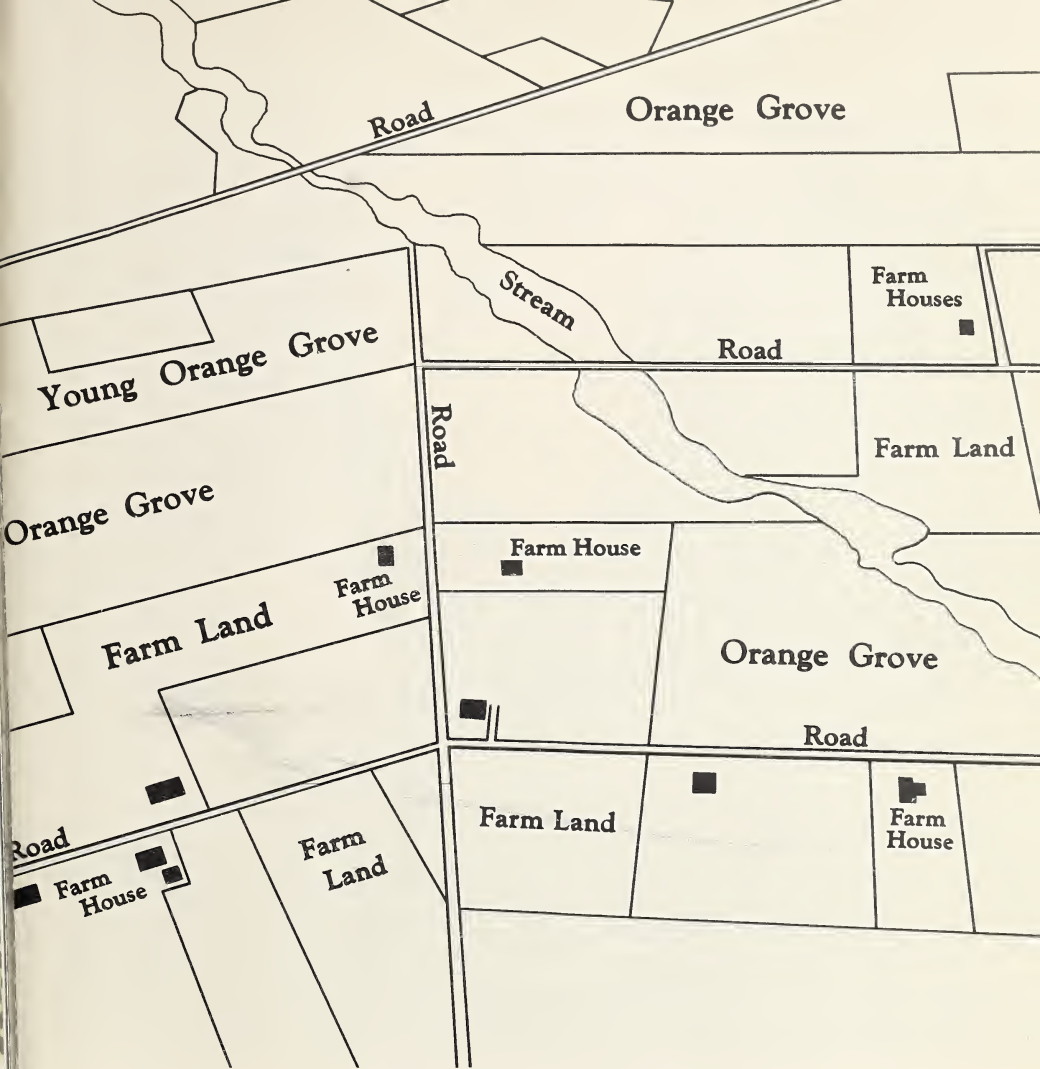
As the plane went higher in the air, you would be farther and farther away from the land. You could then see a larger part of the earth. But you could not see every little thing. The automobiles on the roads would seem quite small. Soon you could not tell whether they were trucks or passenger cars. A man walking along a road below would look like a moving dot. Or perhaps you could not see him at all.

If you were flying near the ocean, you could see clearly where the land ends and water begins. You would have no trouble seeing the coastline. You could see clearly any long or wide river that winds through the land. You could see a mountain range crossing the country. These big things would be easy to see.

When you fly higher above the earth, things become smaller and smaller. There are many little things that you cannot see. The earth is spread out under you in such a way that it looks much like a map, or a plan drawn to show the earth. On the next page is a picture taken from an airplane.



On page 281 is a map of the part of the earth shown in the picture. Tell several ways in which they are alike. In which ways are they different?



A globe makes a better map than a flat picture does, for a globe is round like the earth. In the picture on the next page you can see where North



America lies on the globe. You can see the equator and the point called the north pole.

Again and again in this book we have spoken



of our country. By our country we mean the part of North America in which we live. Our country is called the United States of America. People of our country call themselves Americans. That name, however, belongs not only to us but to all who live in the western hemisphere.

The map on page 283 shows the name of our country. On this map there are two broken red lines that separate our country from other countries in North America. Our country reaches from ocean to ocean. The long river that flows through the middle of our country is called the Mississippi River. Can you find the Columbia River about which you have read in this book? Do you see where it flows into the ocean? That is the place where the salmon swim out of the Columbia into the ocean.

Look again at the map which shows the United States. Though this map is flat, it looks like the picture of our country on the globe. This map shows the shape of our country.

The right side of the map shows the part of our country nearest the rising sun. You have already learned that this is called the east. The left of the map shows the part called the west. The bottom of the map shows the south, the direction in which we see the sun at noon. The south side of our country is nearest the countries where there is never any snow or ice except on the mountains. The top of the map is the north, toward the north pole, where it is always cold.

On this map read the names of the other rivers besides the Mississippi River and the Columbia River. Can you see where the mountains are?

Because our earth is round, a globe shows its shape almost exactly. The maps in books are flat. They do not show how large a part of the earth you would have to go around if you were to go from one country to another. We can make a flat map showing any part of the earth. It may show either a large part or a small part.

You must always remember that the earth on which we live is very large. It would take a long, long time for one person to see all of it. Most people never see more than a small part of the earth.

There are wide oceans and high mountains and level plains on the earth. There are dry deserts both warm and cold. There are hot, rainy forests. There are places where it is so cold that there is always ice. There are a few parts of our earth where no one lives, but most people live in a few very crowded parts of the earth. In big cities many thousands of people work near each other to make their living.

HOW PEOPLE MAKE A LIVING

You know that everyone on our earth has to have food, clothing, and shelter. You know also that these necessities come from the earth. To get these necessities people do some kind of work. Some people earn money by growing food or making things for others to use. Some people make their living by selling things that others need. Some people make their living by helping to move other people or things from one place to another. What a person does for a living is called his occupation.

There are many different occupations. Some people earn their living without growing food or making things or selling them or moving them. A policeman is such a person. So is your teacher.

There are some kinds of work which people do in every part of our country. We find the occupations of doctor, nurse, and lawyer in almost any place where people live. Many occupations are found

only in cities, and others are found only in the country.

In this book you have read about many kinds of work which men do on farms and large ranches. The farmer raises crops or animals to sell. Some farmers raise only one crop, such as tobacco or oranges. Others raise many different crops. Remember the New Jersey farmers who grew different vegetables and fruits to sell to people in cities. Some men go from farm to farm and spray trees to kill insects. Cowboys work on ranches. They must brand calves, feed and round up cattle, and drive the animals to the railroad when they are to be sold.

Some men work at building good roads across our land. Others make their living by keeping hotels or tourist cabins near highways. People who are driving across our country like to have a good bed to sleep in at night.

In cities many people work in factories where meat is canned or prepared so that it can be shipped to other parts of the world. Others work as porters in railroad stations. Lumbering is a country occupation. Catching fish is not a city occupation, but preparing fish for market sometimes is.

QUESTIONS AND THINGS TO DO

About Maps and Globes

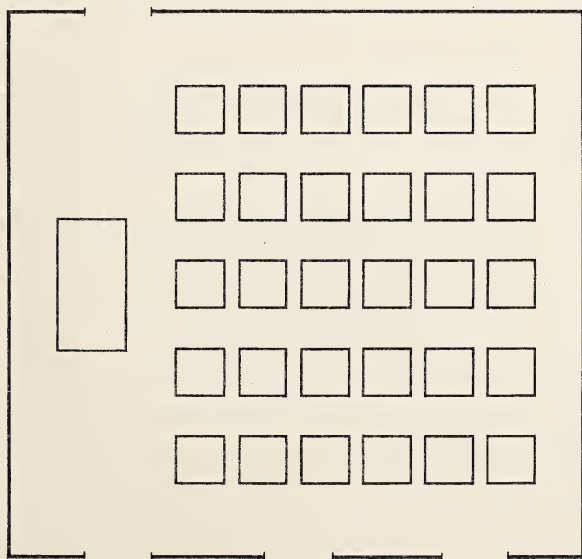
1. Point out on a globe the parts that show land and the parts that show water.
2. Name all the continents on which people live.
3. What two continents are really one continent with two names?
4. Even before you read about a continent, you can tell whether it lies north or south of the equator. You can see whether part of it is north and part of it is south of the equator. You may be able to name an ocean which touches the continent. On a globe show any continent except North America and see how many things you can tell about it.
5. What ocean is east of North America?
6. What ocean is west of North America?
7. Show the equator on a globe. Tell how you know where to find the equator.

8. On a globe point out the cold countries of the north. Point to the warm countries near the equator.

9. As you go from the equator toward the south pole, would you be going into cooler or warmer parts of the earth?

10. Your teacher will draw on the blackboard a plan of your schoolroom. Perhaps it will be somewhat like the one below.

Find your teacher's desk. Find your own desk. Find each window and door. Your teacher will point to different desks on the plan. When she points to yours stand up. If two pupils stand up at



the same time, somebody has made a mistake. Find which one is right. Then, when everybody is standing, your teacher will point to different desks on the plan again, one by one. When she points to yours, sit down. Perhaps your teacher will let one of you do the pointing. If you point to her desk, she will have to stand up or sit down too.

11. In what ways is a plan or map different from a picture?

12. Why is a globe usually better than a flat map?

13. On a wall map show each of the four directions, north, south, east, and west.

14. On a map showing North America find the longest river. What is the name of this river? In what country is it?

15. Find the long ranges of high mountains in the western part of our country. Find the mountains in the eastern part of our country.

16. Look closely at a map showing the shape of our country. Then close your book and draw a map of the United States just as you remember it. Write the directions in the proper places.

17. Ask your teacher to show you on the map the place where you live.

18. On the map which you have drawn, mark these places which you have read about in this book. Your teacher will help you find them. On your map write the name of these places or parts of our country:

Columbia River

Syracuse

western plains

orange groves in the

blue-grass country

southwestern part of

New Jersey

our country

19. On the map of the United States trace a river from the place where it rises, or begins, to the place where it flows into the ocean. Which of these two places is higher ground? How do you know?

About Day and Night and the Seasons

1. Which of these is true of the place where you live?

We have hot summers and cold winters.

We have hot summers and warm winters.

We have warm summers and cool winters.

We have cool summers and cold winters.

2. Name several things that happen in your part of the country in the summer but not in the winter.

3. Why is there always some part of the world where crops are getting ripe?

4. In which direction does the shadow of your house fall at noon?

5. Find out whether your shadow is longer at noon or in the late afternoon. Tell why.

6. Is your shadow at noon longer in summer or in winter?

7. Why is it night part of the time and day part of the time where you live?

About Occupations

1. Tell about your father's or your mother's occupation.

2. Make a class list of all the occupations that you know about.

3. Which of the occupations in your list are those of city people? Which are the occupations of country people? Which might be the occupations of either city or country people?

4. Name the occupation of people who do one of these things to make a living:

moves people or things	sells things
------------------------	--------------

keeps people well	grows food
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